

AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

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CONTENTS

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THE MASQUERADING MAPLE

A Sugar Maple of peculiar form in the Arnold Arboretum. It looks very like a poplar. The photograph was loaned by Mr. E. I. Farrington, and the tree is fully described on page 727.

Editorial	707
Fire Protection to Save Our Forests—By Roy Headley.....	710
With four illustrations.	
America's Youngest Lumberjacks	714
With one illustration.	
Those Paper Clothes.....	714
Pulpwood from British Columbia—By Arthur Newton Pack.....	715
With eight illustrations.	
A Real Community Christmas Tree.....	720
With one illustration.	
National Forestry Program Approved.....	721
State Forest Policies.....	722
Live Game and Forest Recreation—By Arthur H. Carhart.....	723
With nine illustrations.	
The Masquerading Maple.....	727
Forest Fires in Norway.....	727
Black Walnut for Beauty and Utility.....	728
With four illustrations.	
The Uses of Wood—Wood in the Toy Industry—By Hu Maxwell.	731
With twenty illustrations.	
Vocational Forestry Education—By James B. Berry.....	738
"Uncle Bill" Says "Plant Black Walnut".....	739
Timber Conservation in Wyoming—By Quincy R. Craft.....	740
With two illustrations.	
Forestry Editorial Digest.....	742
The Poetry and Prose of French Forests—By William H. Scheifley....	744
Memorial Forests—Why Not?.....	746
Reforestation War-Swept Regions.....	746
The American Antelope—By R. W. Shufeldt.....	474
With thirteen illustrations.	
Book Reviews.....	756
The Gas Pump Useful in Fighting Fire.....	761
Zion National Park Dedicated.....	762
State News.....	764
Forest School Notes.....	766
Fighting the Blister Rust.....	768

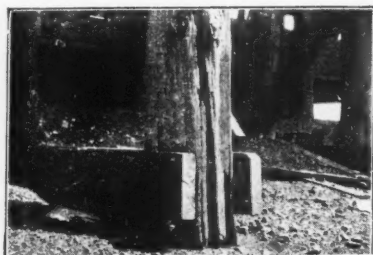
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Decayed post of coal chute foundation.



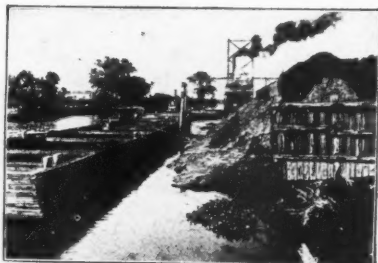
Decayed intermediate sills and flooring of freight cars.



Decay is the greatest enemy of poles. Creosoting protects poles effectively.



Removing decayed roof boards over textile mill—the penalty for neglecting to protect the lumber against decay before erection. (Courtesy F. J. Hoxie, Eng. Assoc. Factory Mutual Fire Ins. Co., Boston, Mass.)



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AMERICAN FORESTRY

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EDITORIAL

CONGRESS AND FOREST SERVICE APPROPRIATIONS

ONE of the important duties of the session of Congress now assembling will be the passage of the annual appropriation bills for the various executive departments of the Government. AMERICAN FORESTRY would like to bespeak its liberal treatment of the Forest Service in general and in four directions in particular. These are increased salaries, fire protection, acquisition of forest lands and research.

During the last few years the integrity of the Forest Service, as of many other Government organizations, has been seriously threatened by the impossibility of paying adequate salaries to the bulk of its employees. This is due primarily to the fact that most of the force is on what is known as the "statutory roll." The salary for each position on this roll is fixed by Congress, or in other words by statute; and Congress has not seen fit to make any material changes in these salaries in spite of the greatly increased cost of living. Lack of funds has also to a considerable extent prevented the merited promotion of many of those whose salaries are set by the Secretary of Agriculture, and who are on the so-called "miscellaneous roll." As a result of this situation many of the ablest and most experienced men and women have left and are leaving the Service, and an unfortunate but inevitable feeling of unrest has developed among those who remain. Pending the passage by Congress of a comprehensive reclassification measure, three things are needed to bring immediate relief: (1) material increases in statutory roll salaries; (2) removal of the present maximum limit of \$4,500 for miscellaneous roll salaries, and (3) appropriation of adequate funds to make possible the promotion by the Secretary of Agriculture of those on this roll.

Additional funds for forest fire protection are also urgently needed. Fire constitutes by far the most serious menace to the perpetuation of the forests of the country and its control is an essential prerequisite to the practice of forestry. During the past year, 27,000 reported fires burned over 8,500,000 acres, to say nothing of the large additional area for which no records are available. Present attempts at control are wholly inadequate, and the current appropriation of \$125,000 for Federal cooperation in the protection of State and private lands is insufficient to enable the Government to bear its fair

share of the burden. This should be increased to at least the \$1,000,000 requested, and the present restriction requiring the expenditure of the funds on the watersheds of navigable streams removed.

The program for the acquisition of forest lands by the Federal Government which was inaugurated nearly ten years ago by the passage of the so-called Weeks Law, should be revived by the renewal of adequate appropriations for the purpose. It is unfortunate that this work, which has already yielded tangible and decidedly worth while results, should have been allowed to lapse and highly important that it should be resumed at the earliest opportunity, with the removal of the present limitation that all purchases must be on the watersheds of navigable streams. In view of the magnitude of the interests involved on annual appropriation of \$2,000,000, is certainly a modest enough sum to be devoted to this purpose.

These and other Forest Service activities should be accompanied by the development of a comprehensive program of forest research. In order to handle our forests and their products effectively, we need to know far more than we now do as to the best methods of forest production and of forest and wood utilization. Such knowledge can be obtained only by properly manned and equipped laboratories and experiment stations. The Forest Products Laboratory at Madison, Wisconsin, the value of whose work has been amply demonstrated, cannot cover its field either fully or adequately with a yearly appropriation of less than \$500,000. A similar amount is needed for investigation of the wide variety and infinite number of problems involved in determining the best methods of growing, reproducing and otherwise managing our forests, and for studies in forest economics. AMERICAN FORESTRY believes that there should be a forest experiment station in each important forest region in the country and hopes for rapid progress toward this goal.

The Forest Service is a business organization which is comparable in many respects to the foremost private concerns in the country and whose activities are even more vital to the public welfare. May Congress increase its effectiveness by providing for its finances in a business-like way.

THE GRAVE PERIL OF THE NATIONAL PARKS

ONE of the most important questions before any Congress will come up for settlement at the next session. It involves the continued existence of our National Parks.

It is an issue between a mere handful of farmers living on the borders of Yellowstone National Park who want it for irrigation, plus certain water power interests with an eye to future possibilities, and a great many millions of people scattered through all the states of the nation who want these reservations to remain in the condition of nature without which they cease to be National Parks.

And yet it is in doubt.

Why? Because the Congressmen who represent these very many millions will not believe that they really care. The irrigationists and water power interests are filling the universe with demands; therefore, this is the voice of the Nation. The alleged many millions who want the parks to stay as they are remain silent; therefore, they do not exist.

If this is not Congressional reasoning, the practical result is the same. At the last session Congress presented the parks to the water power people and were barely stopped by a few hastily gathered conservation associations from including the irrigationists in the gift!

No wonder that associations of many kinds, scientific societies, women's clubs, chambers of commerce, museums, universities, national organizations of all sorts, are combining to tell Congress the plain truth when these measures come up again at the next session. It is high time that this Congress discovers what the real people want.

The fact is that recent Congresses have not appeared to know what our National Parks really are. They call them "playgrounds." They are playgrounds. So are the National Forests. So are Lincoln Park and Coney Island. A distinguished Senator recently asked why Yosemite National Park should get large appropriations when Rock Creek Park, in the city of Washington, had "more visitors last Sunday than Yosemite has in a whole season!"

Our National Parks are National Museums. They are carefully chosen specimens of original America which we are holding for our children's children as an exhibit of the wilderness of the pioneer and the frontiersman. A quarter century from now they will be the only examples of original America in a country whose West will be as fully developed as our East is today. They will be the only examples of primitive wilderness within civilization, and the world will come to see them.

Also they are National Museums of the American forest as Nature takes care of her forest; of native lakes and rivers and waterfalls untouched in pristine beauty; of wilds unblemished by the hand of commerce; of American wild animals in their native habitat, unhunted, undisturbed, unafraid.

We can hand nothing down to future generations more wonderful and more valuable than these few, small, widely separated National Museums of a phase of America that is passing with amazing speed.

Let us tell our Congressmen how we feel about our National Parks.

ITALY AND OUR LUMBER EXPORTS

WITH the close of the great war it was generally anticipated in this country that there would be a tremendous demand for American lumber to assist in the reconstruction of Europe. These anticipations have not been realized. In spite of its unquestioned need for wood, Europe has so far failed to deluge this country with orders, and the lumber export business has, contrary to expectations, remained comparatively dull.

While this is a disappointment to the lumber industry, there is no reason to anticipate serious consequences from it. Lumber exports to Europe before the war formed less than two-fifths of our total exports, which in turn have absorbed less than 10 per cent of the total lumber cut. We have, therefore, never

depended very largely on our European timber trade, and can doubtless do so still less with the steady decrease in available supplies and increase in domestic requirements. Moreover, from the standpoint of forest conservation the failure of the anticipated demand from Europe to materialize may prove to be a real benefit. With the present annual depletion of our forests amounting to more than four times the annual growth, there is danger in increasing the drain upon them. This is particularly true so long as effective measures are not taken to keep our entire forest area productive. If this were done, however, we should be able not only to meet indefinitely our needs, but probably to have a small surplus available for export.

FIRES, GRAZING AND SOUTHERN YELLOW PINE

SO many conflicting opinions have been expressed as to the effect of fires and grazing on southern yellow pine, and particularly longleaf pine, that it is a welcome relief to secure results based on careful investigation and not on guesswork. Such results are now being obtained from a series of sample plots established in 1915 at Urania, Louisiana, by the United States Forest Serv-

ice in co-operation with the Louisiana Conservation Commission. Four plots were located in a stand of very young longleaf seedlings. One of these was completely protected from both fire and grazing; another was grazed regularly but protected from fire; the third was protected from grazing but burned annually; and the fourth was both burned and grazed.

After five years it is clear that in this region longleaf pine seedlings are almost totally exterminated by the grazing of hogs. In the fenced plots the original stand of longleaf pine seedlings has practically disappeared, while in the adjacent fenced plots the number of seedlings has actually increased. Fire, on the other hand, has had comparatively little effect on numbers, but a very marked effect on growth. The difference between the heights of the seedlings on the burned and unburned plots is now most striking and demonstrates beyond question the injurious influence of fire in this respect. Experience elsewhere has also indicated that annual burnings by very hot fires are apt not only to retard, but in time to destroy young longleaf seedlings, while it is common knowledge that loblolly and shortleaf pine seedlings are very susceptible to killing by fire.

These results are corroborated by some supplementary and less intensive experiments undertaken by the Urania

Lumber Company. Hog grazing is uniformly destructive and fires are detrimental. Another interesting fact brought out is that fires encourage the growth of the coarse sedge grass which is of little or no value for grazing, and discourage the growth of the valuable carpet grass, clover and lespedeza; while ordinary cattle grazing, unaccompanied by fire, has the opposite effect. Fire is therefore undesirable from the standpoint of grazing as well as forest production.

These facts have a direct and immediate application. During the present year there is an unusually heavy crop of longleaf pine seed. This should result in the establishment of an excellent stand of longleaf seedlings which could not be secured artificially at a cost of less than \$5 to \$10 an acre. In order to make the most of this opportunity to secure the free restocking of many cut-over areas, forest owners should use every possible precaution to protect the reproduction by keeping out fires and hogs.

CONFERENCE ON FOREST EDUCATION

A CONFERENCE of teachers and employers of foresters has been called to meet at New Haven, Connecticut, on December 17 and 18, to consider the entire question of forest education. The scope of the meeting is thus very broad. Discussion will not be limited to the training of professional foresters, rangers and specialists in various lines, but will include extension work, vocational education, forestry as a cultural subject in high schools and colleges, and the place of research and public service in the forest schools of the country.

Such a conference should be productive of much good. It is ten years since the last meeting of this kind was held. In that time great changes have taken place in the opportunities for foresters and in the character of the men required. New lines of work have opened up and old lines have been modified. Taken as a whole, the problem of forest education today is quite different from what it was a decade ago. It is, therefore, decidedly worth while for those who are interested in the problem, whether from the standpoint of the instructor or the employer, to get together for the free interchange of ideas and the formulation of constructive policies.

AMERICAN FORESTRY ventures to express the hope that certain features of the program will receive special consideration. In its judgment there has been a tendency up to this time to devote too little attention to the training of the lower grades of forest officers—the rangers and guards. Highly trained professional men are of course essential to conduct investigations and to direct the administrative work. But as the practice of forestry becomes more general, there will be an increasingly urgent need for less highly trained men to handle the bulk of the practical woods work. The time cannot be far distant when this country will find itself in the posi-

tion Europe is now in of requiring several rangers for every professional forester. It is, therefore, important that prompt steps should be taken to provide more ample facilities than now exist for the training of men of this type.

There are two other important fields in forest education that are still, comparatively speaking, virtually untouched. A promising start has, it is true, been made in extension activities aimed at teaching the farmer and other woodland owners unable to hire foresters of their own better methods for the handling of their forest lands. But in comparison with the need for such work and with what is being done in many lines of agriculture, the surface has as yet hardly been scratched. Here is a fertile but uncultivated field awaiting development by the forest schools with every prospect of yielding substantial and far-reaching results.

Still less has been accomplished in the direction of teaching forestry as a cultural subject in our schools and colleges. The average student who does not specialize in forestry, completes his work with only the haziest ideas as to the character and extent of our forest resources and their place in our national economy. This is unfortunate from several standpoints. Certainly forests and their products are so closely interwoven in a hundred ways in our daily life that every well-educated man and woman should know more than is now the case of the part which they play. The general diffusion of this sort of knowledge regarding our forests would prove one of the most effective means possible of securing their better management. Here too, is an opportunity not yet taken advantage of for rendering of a dual service to education and to forestry. We hope that the conference at New Haven will take the leadership in promoting effective action along this line.

FIRE PROTECTION TO SAVE OUR FORESTS

BY ROY HEADLEY

TO stop the devastation of our forest land it is not necessary for public opinion to support some new-fangled system of forestry; all that is necessary to keep the bulk of our timber growing land continuously producing timber after it is cut over is the adoption of a different attitude toward fire. More than fire protection is often necessary to keep forest land producing the most valuable species or producing at absolutely full capacity in terms of board feet per acre per annum. But, as a rule, fire protection alone will keep our forest lands continuously producing some timber and avoid the necessity of resorting to artificial planting. Ten million idle

their fields, and who vigilantly guard their family incomes, have exhibited serene indifference to the fires that have left us, among other things, our 81 million non-producing acres and which are still adding to this American Sahara. Not only is there indifference; there is habitual carelessness with fire on the part of the same individuals who are feeling even now the effects of a timber depletion that is caused chiefly by fire.

There were 27,000 recorded forest fires in 1919, burning a total of $8\frac{1}{4}$ million acres. During 1918, 25,000 fires burned over $10\frac{1}{2}$ million acres of forest land. An additional acreage was burned each year of which no



DESTRUCTION OF YOUNG TREE GROWTH IN ONE OF THE MINNESOTA FIRES OF 1918

Observe the prone young trees—blown down by the hurricane which was largely due to the air disturbances caused by the fires. There were good laws for the protection of forests there, but public opinion did not support existing protective legislation, and the result of this situation was the catastrophe which shocked the whole country and left thousands homeless and destitute.

acres in Michigan are a burden, rather than an asset to the State, because of fire. The million acres of non-productive brush field among the timber lands of the National Forests of California are non-producing wastes because of fire. Millions of acres in Pennsylvania which once supported the stands of pine and hardwood, which enabled that State to take first place in lumber production in 1860, have become covered with scrub oak, or other trash, not primarily because of reckless cutting, but because of reckless and repeated burning.

Nothing in the treatment which has been given American natural resources is more amazing than the characteristic indifference of Americans to the wasting by fire of our indispensable resources of timber. Sober-minded people who scrupulously conserve the soil resources of

record could be obtained. Of these thousands of fires only a tiny fraction are due to lightning and unpreventable accident; the great majority of the fires that are constantly enlarging our deserts of barren sand, scrub oak, chaparral and briers, are due to the carelessness of human beings—due, not only to the carelessness of persons who are directly responsible for the fires, but to the indifference of the great body of people whose composite opinion permits the campers, the farmers, the railroads, and others to start and leave or lose control of the fires that do the damage.

The Minnesota fires of October, 1918, which destroyed over 300 human lives and 20 million dollars worth of property, were due to the indifference of public opinion. There were laws in force which, if respected and en-

forced, would have prevented the catastrophe. It was against the law for people to set fires during this period. It was against the law to run locomotives or threshing rigs that set fires. It was against the law for people to ride along the highways throwing burning cigars, cigarettes, or matches into the dry tinder alongside. But public opinion was not united in support of the law. Many persons believed fire a beneficial agency, or at least, not harmful. Public opinion had denied State Forester Cox an adequate number of men to enforce the law and extinguish fires while small. When the wind came up the result of this situation was the catastrophe which shocked the whole country and left thousands homeless and destitute. It is a curious circumstance that these fires burned over part of the area swept by the Hinckley fire of 1894, in which 418 lives were lost and enormous damage inflicted.

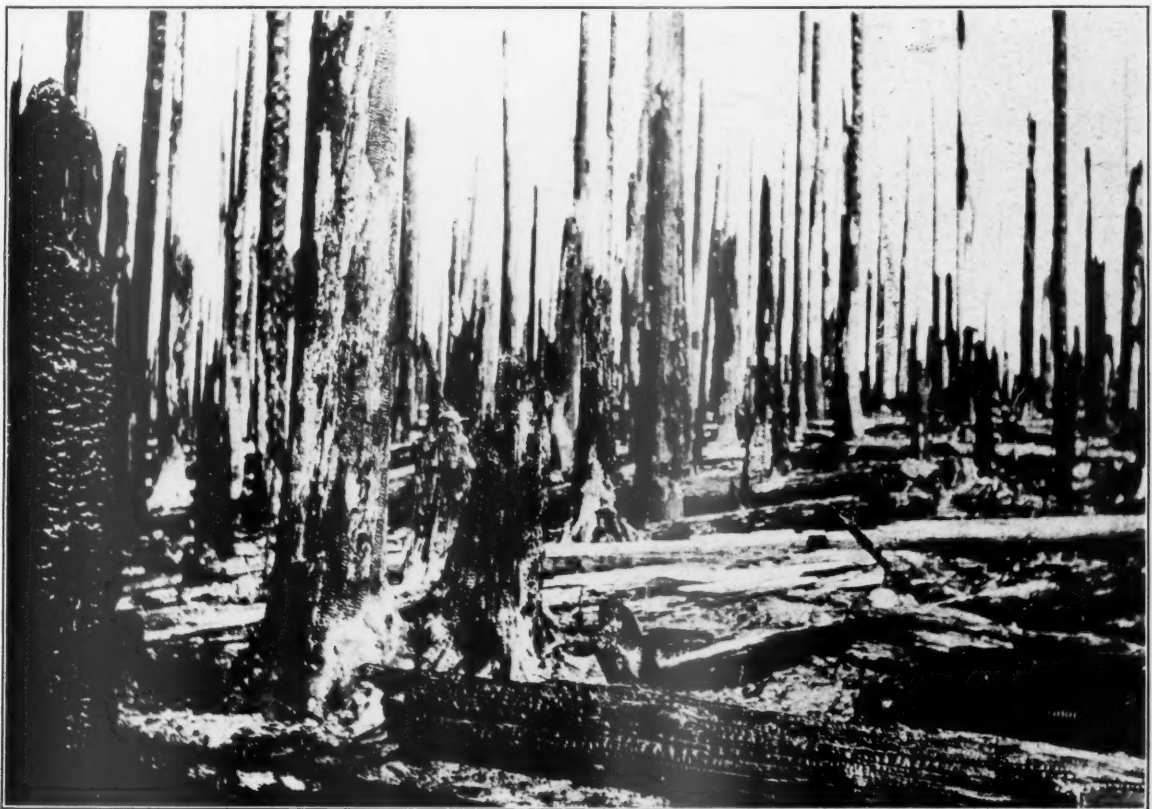
If a foreign army should cross over the international boundary and kill 300 Minnesota people and destroy 20 million dollars worth of property, something would be done about it promptly and vigorous measures would be taken to prevent a recurrence of the disaster. Will public opinion any longer continue to look with indifference, or with only a mild and temporary concern, on the fires that are robbing us of the productivity of our forest lands and hastening the day when Michigan can no longer secure even from Louisiana and Mississippi the oak and hickory she once supplied to her industries, but

will be forced to depend on Siberia and South America?

Pending the enactment of the new legislative program outlined later in this article much may be done by a vigorous enforcement of existing laws prohibiting carelessness and misuse of fire.

It is now possible in many regions to observe the symptoms of a house divided against itself. Public opinion, in its better moments, has secured the enactment in many States of reasonably good laws regarding the starting of fires. Often these laws could be improved, but it is surprising what efficient fire laws are to be found in most States; no law is self-enforcing however, and after securing the passage of good fire laws public opinion has often relapsed and refused both the funds and the sentiment that are necessary to enforcement. State fire wardens, State foresters, and National Forest supervisors are often found struggling valiantly to detect and suppress fires that would never have been started but for the indifference or secret encouragement of local opinion. The result of such a clash of forces is not a happy one. The resulting fire protection is very imperfect. A house divided against itself can not stand.

But in all this confusion there is to be found a clue to one of the most notable recent developments in practical fire protection. Fire laws have usually been considered unenforceable in so far as they relate to the apprehension of the persons immediately responsible for fires. Professional detectives and police officers have



A MAGNIFICENT STAND OF TIMBER COMPLETELY DESTROYED BY FIRE

This example of utter destruction is on the Oregon National Forest and it would be difficult to estimate the total loss. The area has now been artificially planted to Douglas fir, but the old snags and logs will long constitute a serious menace to the growing stand of timber.



FIRE RUNNING THROUGH AN OLD BURN

Forest officers find it next to impossible to suppress such fires in high winds because sparks fly from snag to snag in defiance of human efforts, but much could be done to relieve the terrific danger of large unmanageable fires by the securing of appropriations—State and Federal—sufficient to provide proper protection.

usually been ineffective in dealing with the circumstantial evidence on which the proof for fire law violations ordinarily depends. The detective and police officer are equipped with knowledge and skill well adapted to successful handling of violations of law up to the point where a knowledge of wood craft is required. Crime and criminals are largely confined to cities and settled regions. Few police officers are woodsmen.

The arts of the woodsmen are not easily learned, especially by mature men. It has been found much easier to transfer something of the knowledge and skill of the accomplished detective to the forest ranger, than to add the ranger's knowledge of the woods to the detective's equipment.

The rangers of the National Forests of California were trained in some of the essentials of the art of following clues and recognizing and handling evidence. A vigorous fire law enforcement campaign was inaugurated. The result was that arrests for fire law violations increased 400 per cent the first year and then doubled again the second year. Fires due to human agency began to decrease in a gratifying fashion and, best of all, there was abundant evidence that vigorous fire law enforcement was highly effective in crystallizing and stimulating

public sentiment in favor of fire protection. It is as true in fire protection as in other things that nothing breeds disrespect for a movement more than lax enforcement of a law, and nothing rallies support for a movement, about which opinion is divided, more effectively than vigorous and impartial enforcement of whatever laws there may be in effect on the subject.

Law enforcement has its limitations, of course. The heaviest losses on the National Forests during the three bad years ending with 1919 were due to lightning fires. Serious additions to our 81 million acres of non-productive forest land have occurred, even on the National Forests, because it often happens that from 25 to 100 lightning fires are started by a single dry electric storm on an administrative unit in which the woods are dry as a tinder box and there is only a guard to every one or two fires. When this happens, the result is that some fires get big, destructive, and unmanageable. All big fires are more or less unmanageable. The only way to make protection protect in a lightning country is to provide enough men, telephone lines, trails, and enough of the spirit of "go-get-'em" to make it possible to catch fires small.

The best kind of a fire on the record of a protective

organization is no fire at all. Next to no fire at all, the best looking fire on a season's record is what the United States Forest Service calls a "Class A" fire—one-quarter acre or less in extent. In a lightning belt, to attain a record with a high percentage of Class A fires is a problem in money, men and management. Without more men and money the National Forests must continue, whenever a bad year occurs, to contribute to our national area of non-producing land. Mr. and Mrs. Average Citizen must see that more funds are provided if they want the National Forests to be under protection that really protects.

It is not entirely correct to say that elimination of fires due to human agency is a problem in public opinion, law enforcement and legislation. Here, also, men and money are required. In 1918 State Forester Cox was able to put into the field in Minnesota one man for every 350,000 acres that needed protection; 350,000 acres makes a tract 23 miles square. There were arrests and

National or State leadership—that is necessary enough—but the great opportunity is for the leadership of little groups and middle-sized groups; the man who goes before the little group at the country store or in the smoking room of the sleeping car and stands for better treatment of our country's forest land—this is the leader who just now has an unusual opportunity to form and crystallize public opinion.

Such leaders may find in fire law enforcement one of the topics worth talking about. It provides a definite, understandable banner to raise; and for the benefit of those who are still in doubt, let it be repeated over and over again—fire laws are enforceable; violators, even the smoothest of malicious incendiaries can be apprehended; the proof lies in three years' experience in the National Forest Service in which both Federal and State fire laws have been enforced with increasing success; and last, but not least, that vigorous fire law enforcement can not



A SCENE OF DESOLATION AFTER FIRE ON THE KANIKSU NATIONAL FOREST

The lumber industry of the Inland Empire will decline unnecessarily because of this and similar burns. Nothing is more amazing than the characteristic indifference of Americans to the waste by fire of our indispensable timber resources. Public opinion must be educated to understand that fire protection and scientific forestry are common sense measures calling imperatively for practical support.

convictions for fire law violations, but with a tract 23 miles square for each man to look after, is it any wonder that there were many fires burning uncontrolled on October 12, ready to be fanned by the wind into a catastrophe?

While fire law enforcement requires men and money for State and Federal services, it is nevertheless a comparatively cheap and a comparatively neglected method of fire protection open to all who are interested in fire protection. Private citizens who want to promote fire protection are not in a position to personally run down clues and make arrests, but they can ask questions of their officials and, by offering support and indicating that they expect results, they can create a pressure which will move mountains.

Fire law enforcement is a field in which leadership has a chance to function—leadership by individuals within or without public service. We are at the stage of the development of fire protection when such leadership has its great opportunity and responsibility. Not

be surpassed as a means of enabling public opinion to discard definitely and for all time the old views that belonged with the days when timber was often a nuisance. Fire law enforcement aids public opinion to accept consciously and aggressively the view that the days of too little timber have arrived, and that fire protection, scientific forestry and artificial planting are all common sense measures calling for action on behalf of the interests of the public by its elected representatives.

It is inconceivable that public opinion will much longer risk the forfeiture of the economic advantage this country possesses because of its enormous timber growing resources, or continue to regard with complacency the depletion of our forests until wood products are priced on the basis of imported luxuries. The particular steps recommended by the National Forest Service to put our timber supply on a self-sustaining basis include:

Extension of the Weeks Law, which will enable the Forest Service to assist the States in fire protection and

the practice of forestry. Not less than \$1,000,000 is necessary and should be appropriated with a proviso that States benefiting from the fund must expend an amount equal to that received from the Federal Government.

The Secretary of Agriculture should be authorized to require reasonable standards in the disposition of slashings and other measures necessary to prevent forest devastation. Activities under this law should not be restricted to waters of navigable streams, but should embrace any class of forest lands in the co-operating States.

Enlargement of the National Forests should be provided for by means of purchase of forest or cut-over lands, with an annual appropriation of at least \$2,000,000 for this purpose; by authorizing the Secretary of Agriculture to make land exchanges; and by reducing the methods by which land now in Government ownership may be alienated.

Progressive reforestation of denuded lands should be provided for with a yearly sum beginning at \$500,000 and increasing to \$1,000,000 as soon as the work can be organized on that scale.

Legislation should be enacted providing for the study of the effects of the existing tax methods and practices upon forest devastation.

A comprehensive survey of the forest resources of the United States is needed, and an appropriation of \$3,000,000 should be provided for that purpose.

The continuous study of the technical phases of reforestation in the principal timber regions should be provided for by appropriations which will make it possible to restore and enlarge the forest experiment stations discontinued on account of lack of funds.

THOSE PAPER CLOTHES

SECRETARY BURR, of the National Association of Box Manufacturers, says:

"Rather than wear wood pulp B. V. D.'s, a wall paper shirt with cardboard front, a Chicago American vest and kraft Prince Albert, I shall imbibe a wood alcohol sundae and go to meet my Puritan ancestors in a wooden kimona."—American Lumberman.

AMERICA'S YOUNGEST LUMBERJACKS

ALMERON and Roland Berlangier, aged 11 and 9 years, respectively, are probably the youngest lumberjacks in the world. Working in the New York State forest for their father during the summer, they do the equivalent of one grown man's work each day.

And their work, of cutting up a giant spruce into pulpwood, tells why the cost of your daily newspaper has been going up.

Forestry students from the New York State College of Forestry at Syracuse, on a field trip in the Adirondacks, near Cranberry Lake, New York, measured the tree.

The spruce tree which these baby lumberjacks have been cutting up into four foot lengths for pulpwood, was found, by counting the rings of annual growth, to

have been a sapling fully 300 years ago. The tree which took three centuries to mature, has been cut down by children of 10 years, and its measurement shows it will make about 800 pounds of newsprint paper.



HARD AT WORK

These youngsters fully appreciate the seriousness of the situation, and are determined to do their part toward supplying the paper makers with proper pulpwood.

The work of the baby lumberjacks is one more evidence of the manner in which the nation's raw material supply for its paper mills is vanishing, and of the need for restoring America's spruce forests if newspapers are to continue to be.

WHY IS A RANGER?

"Oh, a Ranger is in danger of congestion of the brain, if he tries to keep all posted up on every latest plan. He is but one lone mortal, at the crossing of the ways of a thousand different theories, of a thousand different days. He must be an expert woodsman and a guide and trapper, too; and must know in all emergencies the proper thing to do; how to fix a motor, mend a leg or rope a steer, play a tune on the typewriter to please the diplomatic ear; also how to run a survey, find a corner where it ain't, and, in extra stressful moments, exercise restraint. He must be a sawmill expert, cowboy and lumberjack, and an information bureau, plumb full of statistic fact. And he must be trained in botany, know every growing plant—so's to educate the cattle what they can eat and can't. He must know the birds and animals, the insects and the fish, their every need and comfort, their every wile and wish, including why a wood chuck would and why a dodo don't, as well as why a whippoorwill and why a coyote won't. All professions and sciences and every common trade is the fund of useful knowledge for which he's highly paid. And still there's something to it that holds the Ranger on, when he tells himself and all his friends that he would fain be gone."—The Idaho Forester.

PULPWOOD FROM BRITISH COLUMBIA

BY ARTHUR NEWTON PACK

RAPIDLY mounting costs of newsprint and other kinds of paper during the last two years have suddenly called to the attention of the public the startling fact that the mills of the eastern section of the country must be supplemented by mills elsewhere; that the annual supply of pulpwood in the East must be increased by fire protection, reforestation and other measures, and that new supplies must be developed and the production increased.

A few years ago the location of the pulpwood supply was a matter of little moment to any but the paper manufacturers. Today not only these manufacturers, but representatives of this government and foreign nations are searching the world for available supplies. We are looking from our already limited eastern forests and those of eastern Canada to the Pacific coast—Washington, British Columbia and Alaska.

According to the reports published in 1918 by the Commission of Conservation of Canada, the total amount of timber in the coast region of British Columbia of species suitable for the manufacture of pulp is over ninety-two billion feet, or approximately one hundred and thirty-two million cords. In British Columbia one cord of pulpwood is taken as equivalent to six hundred board feet. Nearly two-thirds of this is western hemlock (*Tsuga heterophylla*), a wood which seems to possess certain necessary qualities of fibre which permit its use largely in place of spruce for the manufacture of newsprint pulp. Of the rest fifty-eight per cent is Sitka spruce (*Picea sitchensis*), and forty-two per cent balsam (*Abies Grandis* and *Abies Amabilis*).

The pulpwoods are quite generally found in stands mixed with Douglas fir and western red cedar, but British Columbia has a distinct advantage over the coast forests of Washington and Oregon from the point of view of the pulp manufacturer, in that almost pure stands of pulpwood may be found on easy logging ground and at generally lower altitudes than on our side of the line.

Not all of the ninety-two billion feet mentioned above can be utilized solely for the manufacture of pulp. Because of the strength of its fibre clear spruce lumber is always in good demand and brings prices equal to Douglas fir—its use in the manufacture of airplanes, for instance, having been much emphasized during the past war. Now that after the war surpluses have been absorbed, many pulp mills cannot afford to pay the prices demanded for spruce logs, and such concerns as do not control their own supply are obliged to yield to sawmill competition. Balsam makes an excellent box wood, but as yet British Columbia paper manufacturers have had little competition from that source.

The country is just awakening to the value of western hemlock as a saw timber. On the Pacific coast western hemlock is already quite generally preferred to fir for interior wood work, or in any place where it is not to be exposed to the weather. The grain is more pleasing to the eye than that of fir. The British Columbia sawmills cut 175 million feet of hemlock during 1919, and received as high or higher rates for the lumber than for Douglas fir although they paid from \$5.00 to \$8.00 per thousand less for the logs. During the same year the British Columbia pulp mills produced 190,000 tons of pulp, sul-



Photograph by Arthur Newton Pack.

SITKA SPRUCE FROM BRITISH COLUMBIA FORESTS

This spruce, of which there are some twenty-five million cords in the coast region of British Columbia, has been made into a form of boom known as a Davis raft to be towed. The logs were cut by the Powell River Paper Company on Kingcome Inlet.

phite, sulphate and groundwood, which might be estimated as consuming two hundred million feet of logs. If sixty percent of the wood so consumed was western hemlock the total consumption of hemlock by the pulp mills would be only 120 million feet—less than the sawmill consumption by fifty-five million feet.

There are at present operating in British Columbia five pulp producing companies with an estimated total annual capacity of some 240,000 tons. It is difficult to make a correct estimate of capacity at a given time as some changes in control are being made and the capacity of one or two companies is being increased. Each of these concerns controls timber estimated to last them from forty to one hundred years, the aggregate stumpage controlled being probably about twenty billion feet.

cut, known as a "Royalty," this royalty also being fixed for a period of five years in advance with provision for extension for subsequent five-year periods on a sliding scale in accordance with certain log market quotations. A "Timber Limit" or "Timber License" is such a permit covering a particular square mile of territory. These licenses are now perpetual and are transferable. They cover almost the entire commercially timbered area of the coastal region.

Logging in much of this region is generally carried on quite independently from sawmill and pulp mill operations by a variety of loggers and logging companies. Accordingly Vancouver has become the location of a large open market for logs—the buyers being the sawmills and pulp and paper companies. The pulp and paper



Photograph by Arthur Newton Pack.

HEMLOCK LOGS FOR PULPWOOD

Over sixty-two billion feet or eighty-eight million cords of this hemlock suitable for pulpwood is on the coast region of British Columbia. The logs in the photograph are ready to be hauled to tidewater and towed to the Howe Sound plant of the Whalen Pulp and Paper Mill.

This stumpage is chiefly held under so called pulp leases from the British Columbia Government. On some of the older leases the rental paid amounts to only two cents per acre and the government collects a flat royalty of 50 cents per thousand feet for the timber when it is cut. The more recent leases and renewals of the old ones now call for an annual rental of 22 cents per acre and a royalty of 87 cents per thousand, which is the same as the regular rate for standard Provincial Timber Licenses. Forest titles in British Columbia forms a subject in itself which cannot be treated here. It is sufficient to state that less than one-fifth of the forested land of the coastal region is owned outright by individuals, the patenting of commercially timbered land having ceased by act of the Provincial parliament. The bulk of the forested region remains the property of the Province of British Columbia which leases the right to cut the timber thereon—rentals being set for a period of thirty years in advance. The government takes most of its pay in the form of a charge on the timber when

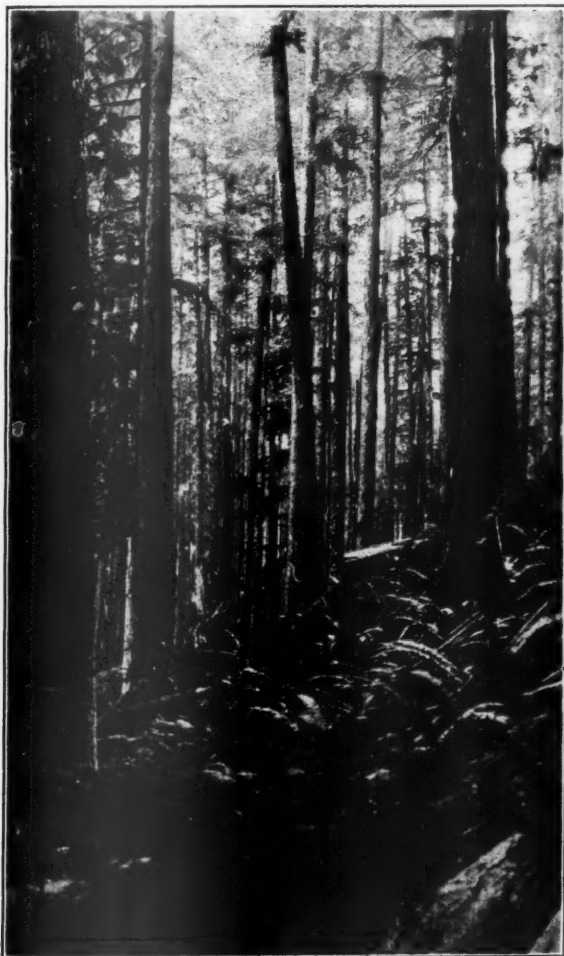
companies are regularly large buyers of hemlock and balsam logs, but usually take delivery at the loggers' camp or some northern point rather than at Vancouver, as the nearest pulp mill is 32 miles up the coast and the others range from 75 miles to several hundred miles north and west. The sawmills on the other hand are chiefly in and about Vancouver. During the recent slump in the price of cedar and fir logs representatives of the pulp companies continually urged the loggers to put in more hemlock, and contracted to buy hemlock logs at prices which have permitted many loggers to get through the slump in pretty fair shape. Apparently this policy is pursued by the pulp companies not only to conserve their own supply but also to avoid the necessity of themselves investing in more logging outfits and equipment when increased raw material is needed. Then too their pulp leases naturally contain a fair proportion of saw timber—cedar and fir—which offers a problem for disposal, particularly when the lumber market

is weak. The purchase of pure pulpwood in the open market in a large measure obviates such necessity.

These recent developments tending to enhance the value of the formerly despised western hemlock furnish a situation which was hardly dreamed of only a couple of years ago. The timber investor who once thought himself "stung" and found too late that he had bought timber licenses with little or no market value in spite of

separate districts—each with slightly different logging and marketing conditions.

The first district, and best known, is that frequently called the Sheltered Waters district. It extends from Vancouver north and west along the mainland coast taking in the many inlets and islands as far north as the end of Vancouver Island. Where the Gulf of Georgia ends in a maze of small islands and channels near Campbell River on Vancouver Island this district extends across and includes the northeastern section of that island up to the northern end. Of this district Vancouver is the marketing center and the open market for logs generally prevails with competition between sawmills and



Photograph by Arthur Newton Pack.

NEWSPRINT IN THE MAKING

A heavy stand of medium sized but very tall hemlock on Vancouver Island which will furnish pulpwood for the making of newsprint.

not unfavorable location and good logging chance, now finds that he has a valuable investment. The logger who was accustomed to entirely overlook the little patches of pure hemlock and balsam along the creek bottoms except when he needed boom sticks, now leaves his cedar for the time being and builds his road so as to reach all the pulpwood he can. Lately even the sawmill operator who counted hemlock lumber his most paying line, because he could buy the logs cheap and sell the lumber at fir prices, has begun to look around for a location where the pulp mill buyer offers less keen competition.

There are such locations. The British Columbia coast has several distinct natural barriers which tend to form

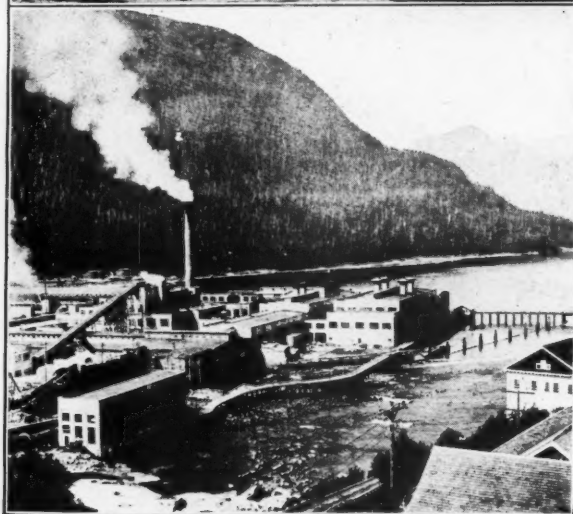


Photograph by Arthur Newton Pack.

BALSAM IN BRITISH COLUMBIA

A large stand of balsam in British Columbia will help to supply the demands for pulpwood in the United States and Canada.

paper mills for the pulpwoods. There are four pulp mills in this region: The Mill Creek plant of the Whalen Pulp and Paper Mills, Ltd., on Howe Sound; the former Rainy River Pulp and Paper Company, Ltd., now being reorganized, at Seaside Park; the Powell River Company, Ltd., at Powell River, and the Beaver Cove Pulp and Lumber Company, Ltd., at Beaver Cove. The



Photographs by R. S. Kellogg.

PULPWOOD LOGS AND PAPER MILLS

Upper—Spruce logs for making paper at Ocean Falls, British Columbia.

Middle—Pulp and paper mills of the Powell River Company, Ltd., British Columbia.

Lower—Pulp and paper mills of the Pacific Mills, Ltd., at Ocean Falls, British Columbia.

Powell River Company turns out 75,000 tons of newsprint per annum, while the other companies make only chemical pulp, as follows: Mill Creek, 24,000 tons sulphite pulp; Beaver Cove, 12,000 tons sulphate pulp. It is understood that the Seaside Park plant is to produce 12,000 tons per annum.

From Campbell River southward along the easterly shore of Vancouver Island, the territory served by the E. & N. Railway, the timber is more readily tributary to mills at Vancouver or scattered along the railway. The Gulf of Georgia is here wide and often rough, making towing to Vancouver more hazardous. Here are no pulp mills and consequently no pulp mill competition for logs. In fact nearly all the logging is done by the sawmill companies themselves, and the independent logger is conspicuously absent. The hemlock and balsam in this area is sold only for saw timber. On the other hand the Canadian Government Railway is being extended through to Port Alberni, on the west coast, and in this westerly area so much pulpwood is to be found that probably a few years may well see the construction of a pulp mill in the Port Alberni neighborhood, and the consequent introduction of the competitive demand for hemlock and balsam.

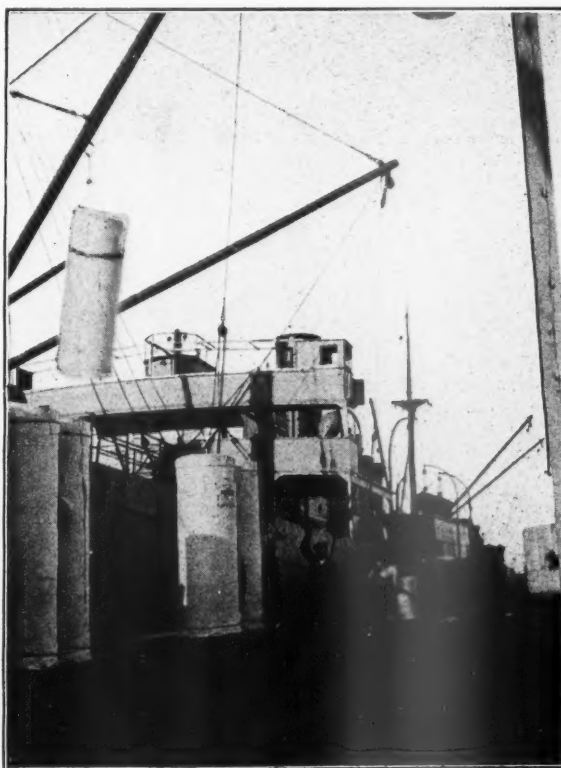
The west coast of Vancouver Island is another separate district. Its inlets are deep and protected just as in the Sheltered Waters area, but to reach the log market of Vancouver booms would have to be towed around through the open Pacific. The risk has been found to be too great for practical operations of this kind, and consequently here again there are no independent loggers. This area runs very highly to pure pulpwood stands, the fir which forms very heavy stands near the southern end of the island, gradually diminishing until in the neighborhood of Quatsino Sound it is seldom seen. The cedar also becomes comparatively scarce. The typical development of this area is shown by the export pulp mill of the Whalen Pulp and Paper Mills, Ltd., at Port Alice, Quatsino Sound—a sulphite pulp mill with present capacity of 18,000 tons per annum, but designed for an ultimate production of 60,000 tons. In connection with this plant is a saw and shingle mill cutting for export, and designed to take care of whatever saw timber is found mixed with the pulpwood stands. This company has sufficient stumpage around Quatsino Sound to supply its mills for a number of years to come with considerably more lumber in adjacent holdings available for purchase at a reasonable price. The products ready for export are sometimes loaded on scows for towing to regular export points, but already ocean freighters have docked at Port Alice, and with the expansion of the pulp capacity doubtless more of the product will be thus loaded at the plant. According to the report of the Commission of Conservation of Canada nearly one-third of the pulpwood of the British Columbia coast area is located in the west coast region of Vancouver Island.

The Northern Mainland is often considered in conjunction with the Queen Charlotte Islands as a single district, although there is more or less climatic difference.

In this region is located the Pacific Mills, Ltd., plant at Ocean Falls with a capacity of 70,000 tons of newsprint and 15,000 tons of Kraft paper and Kraft pulp per annum, and also the Swanson Bay plant of the Whalen Pulp and Paper Mills, Ltd., with a capacity of 12,000 tons of sulphite pulp per annum. These mills obtain their timber largely from leases and timber licenses along these northern inlets and also from the Queen Charlotte Islands. There are a few small independent loggers who sell their output also to the sawmills at Prince Rupert.

These natural barriers, bringing about separation into districts, cause a distinct variation of stumpage values between the different regions. Within the Sheltered Waters area the price for a given class of stumpage is governed largely by towage rates for logs to the Vancouver market. It must be borne in mind however, that in speaking of the market value of stumpage in British Columbia, only the value of the right to cut the timber is meant. In reality the timber continues to belong to the government until cut and the royalty paid. To compare the price of British Columbia stumpage with timber in the United States one must add to the purchase price the amount of royalty which will have to be paid on the logs cut, and even then allowance must be made for the saving in carrying charges brought about by the deferred payment of royalties. It would be safe to say that readily loggable hemlock and balsam stumpage in the Sheltered Waters region now brings from \$1.00 to \$1.25 per thousand. On the west coast of Vancouver Island, however, out of the safe towing area, prices of less than half this amount are frequently encountered. Nevertheless, the small investor in pulpwood stumpage usually prefers to stick to the inside coast, where the independent loggers working for both pulp and sawmills are ordinarily ready buyers of a good logging chance, and the owner of a single good timber limit generally has as much opportunity for profit as the man with half a billion feet. For the same reason the conservative investor has usually kept out of the Northern Coast district, leaving that ground for those who are financially able and willing to put in their own developments and sell the product as finished lumber or pulp.

Forest fires have become such a serious menace to our national timber resources that the generally low fire risk in British Columbia should be mentioned. Primarily the Provincial Government has instituted an extremely good system of fire protection, which appears to be quite intelligently administered, the fire rangers being given sufficient authority to commandeer available assistance needed in fire-fighting. Each ranger, however, has rather too much territory to cover most effectively. The cost of the service is divided between the government and the timber license owners, and all timber licenses and leases are now assessed at two cents per acre.



Photograph by R. S. Kellogg.

CANADIAN NEWS PRINT FOR AUSTRALIA

Newspapers of Australia use large quantities of the newsprint made by British Columbia mills, the rolls shipped being nearly twice as tall as a man. The photograph shows the loading of paper at Powell River, B. C.

fires start, but in many cases the timber is so "pocketed," one tract of several square miles being shut off from another by high mountains, that the risk is a minimum.

The growth of the pulp and paper industry in British Columbia was very rapid in the last two years. Chemical wood pulp production in 1911 was 90 tons, in 1914 it had grown to 13,000 tons, in 1917 to 46,507 tons and in 1919 to the top production of 89,520 tons.

Mechanical wood pulp production, practically nothing previous to 1917, was 65,620 tons that year and 99,769 tons last year, while the production of paper developed steadily from 45,816 tons in 1913 to 130,809 tons in 1919. Larger productions than these top figures are expected both this year and next.

The real protection of the British Columbia pulpwood forests is climatic, the rainfall varying for different districts and regions, but generally high all along the coast. In the Sheltered Waters region the rainfall varies from about 60 inches to over 100 inches, with nightly heavy fogs in the northerly portions during a large part of the year. Southeast Vancouver Island has the lowest rainfall—averaging about 46 inches, but the west coast has from 70 to 118 inches of precipitation each year, the higher records being made nearest the ocean and the lowest inland. The Northern Mainland area is reported to have from 60 to 170 inches—again decreasing further from the coast, while the Queen Charlotte Islands have as low as 40 inches per annum. During the summer dry season nearly every district frequently suffers considerable fire loss, usually adjacent to logging operations from which the

A Real Community Christmas Tree

THE community tree at Walpole, New Hampshire, the first to be reported to the American Forestry Association, was planted by the Town Improvement Society of that village as a memorial to the late Judge Henry E. Howland, of New York City.

Judge Howland was born in Walpole, and during his long and distinguished career never failed to hold his boyhood's home in loving remembrance. He was a frequent visitor there, and his genial presence, and delightful speeches were a feature of Old Home Day and other celebrations. He was a devoted friend and interested in everything that could be of benefit to the town. He

loved the beautiful trees which adorn the village streets, and on one occasion succeeded in preventing the destruction of some very fine specimens, and contributed liberally to the fund which the Improvement Society raised for planting new trees to replace those which were dying.

It was suggested by F. A. Spaulding, president of the Improvement Society, that

an evergreen tree, to be known as the Henry E. Howland Memorial Tree, be planted on the village common, and that it be used as a community tree which should symbolize the lasting affection between Judge Howland and his native place.

In order that the meaning of the tree

may never be forgotten Judge Howland's daughter, Miss Frances L. Howland, has had set in the concrete of the tract crossing the common beside the tree a marker with this inscription:

THIS TREE WAS
PLANTED BY
THE WALPOLE
TOWN
IMPROVEMENT
SOCIETY
IN LOVING
MEMORY OF
HENRY ELIAS
HOWLAND
1835—1913



THE BEAUTIFUL COMMUNITY CHRISTMAS TREE AT WALPOLE, NEW HAMPSHIRE, WHICH WAS ORIGINALLY PLANTED AS A MEMORIAL IN HONOR OF JUDGE HENRY E. HOWLAND

The tree has been illuminated on

every Christmas Eve and on successive nights, except the war Christmas, when, to conserve electricity, the Christmas trees throughout the country were generally dark.

The beautiful old custom of singing Christmas carols round the tree has been established, and after that the choristers move on, singing carols outside homes where there are "shut-ins," or where there is illness.

NATIONAL FORESTRY PROGRAM APPROVED

IN New York on October 15, for the first time after many years of agitation and controversy, a definite proposal for a national forest policy received the preliminary endorsement of the several elements chiefly concerned, which promises well for its adoption and for its success through their co-operation and through fair sharing of public and private responsibility.

At this conference accredited representatives of the nation-wide lumber and paper industries which control most of the commercial forests in private ownership met with similar representatives, speaking in behalf of the general public, and of the wholesale lumber distributors, the newspaper organizations vitally interested in the paper supply as well as in general economic welfare, and the great wood-using industries such as furniture and vehicle manufacturing, railroad operation and the like.

These organizations included the following:

National Lumber Manufacturers Association, National Wholesale Lumber Dealers Association, American Pulp and Paper Association, American Newspaper Publishers Association, Association of Wood Using Industries, Western Forestry and Conservation Association, United States Chamber of Commerce, American Forestry Association.

Unanimous agreement was reached on all essentials of a federal legislative program, more specific in detail but substantially in accord with the recommendations made last June to the United States Senate by Chief Forester W. B. Greeley. Colonel Greeley was also at the conference by invitation and gave its conclusions his full approval on behalf of the United States Forest Service. It is expected that this preliminary agreement, being thus so significant of accomplishment through its full consideration of the public welfare, will receive the ratification of all the public and private agencies represented, and also be acceptable to the majority of others interested, including the forestry departments of the several states.

The primary provisions are two-fold—for a considerable extension of direct federal activity in forest ownership and production, and for the development with federal aid and encouragement of such systematic policies in the several forested states as, being consistent with local conditions, will bring about adequate forest protection and reproduction in the interest of these states and of the public at large.

With these aims, the program provides specifically, through co-operation between the Government, the states and owners of timberlands, for adequate protection against forest fires, for reforestation of denuded lands, for obtaining essential information in regard to timber and timberlands, for extension of the National Forests, and for other steps all essential to continuous forest production on lands chiefly suitable for this purpose.

Much of the responsibility thus outlined lies with states and with private owners. To define that which lies with the Government and hence is properly for the con-

sideration of Congress, the following legislation is proposed.

1. Authorizing the Secretary of Agriculture after consulting appropriate local agencies to approve an adequate policy for each state, covering the essentials of fire protection on timbered and restocking lands, reforestation of denuded lands, and, where and to the extent necessary, the cutting and removing of timber crops so as to promote continuous production of timber on lands chiefly suitable therefor, and authorizing his co-operation in the work required, provided there is also satisfactory local compliance in state legislation or administrative practice. Chief, although not entire emphasis for the time being on fire prevention, as the most important single step, and not less than a million dollars annually available for such co-operation with states.

2. A survey to obtain necessary information as to forest resources, forest production and forest requirements of the nation.

3. Provision for studies and experiments in forest re-production methods, wood utilization, timber tests, wood preservation, development of by-products and other steps to bring about the most effective use of the nation's forest resources.

4. Provision for a study of forest taxation, to assist states in devising tax laws which will encourage the conservation and growing of timber. Also methods of insuring against forest losses by fire.

5. Provision for more rapid replanting of the vast areas of denuded lands within the National Forests.

6. Appropriation of ten million dollars a year for five years for the purchase of lands which should be added to the National Forest system, whether or not on the headwaters of navigable streams as such purchases are now limited.

7. Authorizing acquisition of similar lands by exchanges of land or timber when clearly in the public interest.

8. Authorizing the addition to National Forests of lands now in other forms of government ownership but found chiefly suitable for permanent forest production.

Some of these features of a complete Federal program will doubtless be covered in whole or in part by recommendations to Congress by the Secretary of Agriculture in connection with the agricultural appropriation bill. It was felt by the conference, however, that they should be presented in a comprehensive measure clearly setting forth the picture of an adequate national forest policy and proper Federal participation therein. By this means, with other efforts, the necessary private and state participation can best be shown and obtained.

The American Forestry Association, representing the public, was delegated to take charge of the educational campaign in the endeavor to secure the passage of the bill and will call upon the public and every interest con-

cerned for their approval of the bill and support in the endeavor to have it passed.

A week following the meeting of October 15, a conference of state foresters and forest educators was held for the purpose of discussing and working up a state forestry program. A fundamental statement was prepared and this will be submitted to foresters and educators not able to attend, for suggestions, and will then be considered by various organizations interested and concerned in the movement for a forestry program. They will give the state program the assistance needed to secure its enactment by state legislatures. At this conference those present were: Alfred Gaskill, State

Forester of New Jersey; C. R. Pettis, State Forester of New York; Forrest H. Colby, State Forester of Maine; Philip W. Ayres, Society for Protection of New Hampshire Forests; Dr. J. W. Toumey, Dean, Yale Forest School; Prof. F. F. Moon, Dean, State College of Forestry, Syracuse; Ralph S. Hosmer, Department of Forestry, College of Agriculture, Ithaca, New York; J. G. Peters, Acting Chief, Branch of Forest Management, United States Forest Service; R. S. Kellogg, News Print Service Bureau; O. M. Porter, Assistant Secretary, American Paper and Pulp Association, and Hugh P. Baker, Secretary, American Paper and Pulp Association.

STATE FOREST POLICIES

THE Committee on Forest Conservation of the American Paper and Pulp Association presented at a meeting in Chicago, November 11-13, a report on state forest policies adopted after conferences with state foresters and educators. It was approved by the meeting and is as follows:

"The responsibility for the carrying out of a National Forest Policy, aside from the administration of government-owned lands, rests upon the State authorities and private owners, since under our form of government the control of corporate and private activities is retained primarily by the States, and is not delegated to the Federal Government.

"In order, therefore, to link up National, State and private activities in an effective program, it is necessary that the States in which forest land constitutes any considerable factor shall establish essential requirements in protecting timbered and cut-over land from fire, in reforestation denuded lands, and, where and to the extent necessary, in the cutting and removing of timber crops by such methods as will promote continuous production of timber on lands chiefly suitable therefor.

"With due regard for all interests concerned, based upon its own experience and study of the question, together with suggestions received from many prominent foresters, your Committee believes that an adequate and effective State Forest Policy should include the following principles and provisions:

"1. That all soil shall be made productive of the crop to which it is best adapted or for which there is the greatest public need.

"2. That while agriculture and forestry are based upon soil production, the methods necessary in forestry and the time involved are so different from those of agriculture that forestry demands an entirely different form of administration.

"3. That State Forest Policies shall be initiated and carried out in co-operation with the National Government and with private owners wherever and to the fullest extent possible.

"4. That State Forest Legislation shall establish general principles and procedure only and vest in a properly

constituted and non-political body, acting through technically qualified representatives, the responsibility for the fixing of regulations and enforcing them.

"5. That the paramount and immediate consideration in any Forest Policy is the creation and maintenance of effective means for the prevention and control of fire on all forest lands of whatever ownership, and that every owner of forest land shall be required to conduct operations thereon in such a manner as to avoid creating a fire menace to adjacent property.

"6. That forest surveys, land classification, forest research and forest education shall be provided for.

"7. That there shall be such changes and adjustments in prevailing systems of taxation as will enable all forest lands to be equitably taxed thereunder, yet will not discourage the holding of private forest land for future crops without impairing local revenues.

"8. That the state, upon request, shall assist the private owner of forest lands to make them continuously productive through the preparation of working plans, supplying of planting material and supervision of silvicultural operations free of charge or at cost.

"9. That the state be empowered to take over at a fair valuation and administer as part of the system of public forests any land, which, after competent examination, is classified as suitable only for timber growth, in case the owner refuses to avail himself of the opportunities and assistance provided by the public to encourage forestry upon private lands.

"10. That the acquisition of forest land by the State is essential to a sound forest policy.

"11. That all State-owned forests shall be utilized for continuous production, both for direct returns in forest products and indirect returns in soil protection, game and recreation.

"12. That all State-owned forest property shall be capitalized upon the records of the administrative body so that all expenses in connection with the development thereof and returns therefrom may be accounted for on a business basis to the people of the state who furnish the funds for the undertaking and enjoy its results."

LIVE GAME AND FOREST RECREATION

BY ARTHUR H. CARHART

PURPLE-GRAY shadows crept into the lake basin. Dusk's domain was invading the land that a moment since had been gorgeous with the flash of the sun's rays the instant before he climbed down behind Marvin's peak. In silence the Traveler and I sat while he smoked his pipe and dreamily watched deep black shadows come up out of the depths of the lake to hide under the overhanging spruce trees until next day's sun should drive them back to watery fastnesses behind deep reefs in the lake.

"Saw some grouse today," remarked the Traveler, after a long meditative puff.

Another long pause ensued. A trout leaped desperately after a moth or fly and smacked the glassy water surface in his fall.

Then the Traveler made a remark which has come to my mind many times since and under many different conditions. "You know," he said softly, "if I could only see a bunch of wild elk or one flock of mountain sheep while I am out here and see nothing else all the time I am here I would feel that every cent I have put in this trip was repaid."

Figuring what I knew the Traveler was spending on his little outing quickly brought to me his value of that one look at a flock of native mountain sheep. It is hard to believe that a man would pay more than a dollar or so to see a wild bighorn in a cage or an elk in a zoo but the Traveler by his statement had valued that one glimpse of the sheep in their native setting at no less than five hundred dollars and knowing

the Traveler I realized that it was his true valuation of a glimpse of a flock of bighorn.

Since the night the Traveler made this remark many like remarks have come to notice. Men have taken hard trips just for the chance of seeing a band of deer or elk. Others lucky in seeing a band have told, jubilantly, of their good fortune and still others have been disappointed deeply when they have failed to see any large game whatever in some of the mountain regions visited.

So there has been presented a problem in calculation which cannot be solved by rule of thumb nor by any one individual. And that problem is the actual value of living game as one of the features one may enjoy when visiting forest land on a vacation. For years the keen enjoyment of the hunt

lured many men from desk and shop to spend days filled with long tramps, lively appetites and the joy of living. Game in the forest meant a motive for spending time each year in an outdoor life that netted not only trophies but better health and clearer vision.

Today big game may be taken still in

many parts of the country but it has decreased in numbers to a point where it is a real task to bring home a set of antlers. The lake at which the Traveler camped was twenty years ago the very center of a population of elk, deer, sheep and other large game that literally overran the country. That remark passed the evening last fall when I sat at the door of the Traveler's tent meant



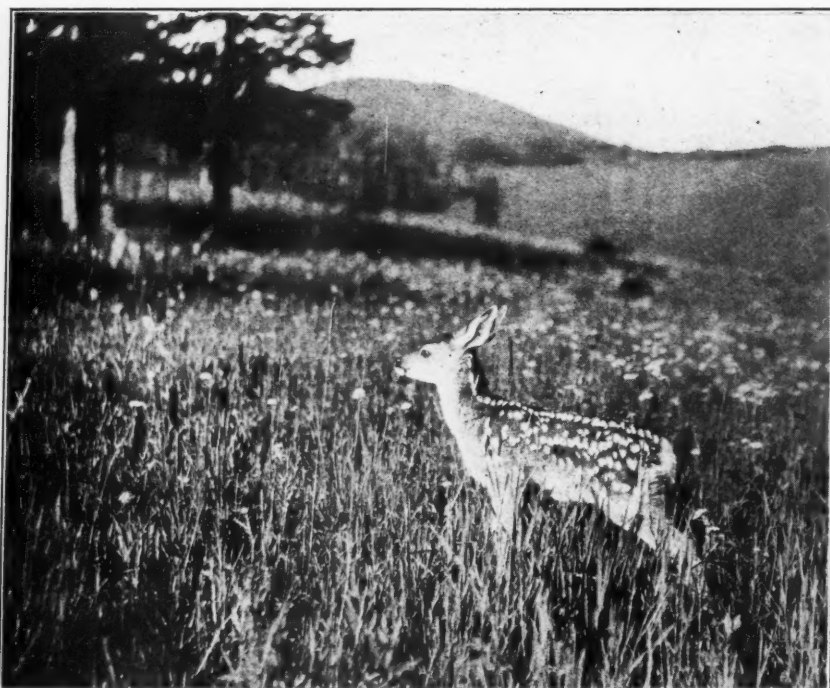
Photograph by Hosmer.

A BIGHORN BUCK IN THE UNCOMPAHGRE NATIONAL FOREST—SEEN AT HIS BEST, POISED ON A ROCK IN HIS NATURAL SETTING AMONG THE CRAGS AND PEAKS OF THE MOUNTAINS



Photograph by Christopher.

ONE GREAT RECREATION VALUE OF THE FOREST IS FOUND IN THE PRESENCE OF LIVING GAME, AND SOME MEN WOULD GLADLY TRAVEL FAR FOR A GOOD LOOK AT THESE MOUNTAIN SHEEP ON THE UNCOMPAHGRE NATIONAL FOREST



THE URGE TO SEE WILD ANIMALS IN THEIR NATIVE HAUNTS IS CERTAINLY INBORN IN MOST OF US AND MANY MEN HAVE TAKEN HARD TRIPS JUST FOR THE CHANCE OF SEEING A BAND OF DEER OR ELK OR STARTING A FAWN IN AN OPEN ASPEN PATCH

that after a ride which had covered every possible hiding place over a course of twenty miles for the day he had not seen one head of large game.

Many elements go to make up the values found in live game in recreation territory. The urge to see wild animals in their native haunts is certainly inborn in most individuals. There is a certain feeling of brotherhood when one is out in the field, knowing that he will not fire on game if he sees it, and suddenly surprises a doe and fawn comfortably housed in an aspen thicket. The life battle of the deer family is suggested when the mother deer starts, quick as a flash, to get the fawn and herself from harm's way. One cannot help but feel sympathy for an existence spent in protecting life itself. To one thus finding a wild thing which is harmless and yet mortally afraid of all living things of predatory nature comes a profound yearning for good fortune to follow the wilding. Life in the landscape brightens the outlook. Many years ago in the private parks of long forgotten princes peacocks preened and in the broader open spaces deer fed in peaceful security. In our

modern parks are bears, deer, bison and many of the wild things of our native land which are kept there not only because of the interest from an educative and scientific standpoint but because of the livening of a certain section of the public grounds. It must be said in all candor that with little or no exception the average park zoo falls far short of what could be accomplished in this particular field of use. The conventional iron fenced cages so detract from this effect that such people as the Traveler who any day in his home town might have, for a few cents street carfare, viewed the entire zoo of one of the parks of the city, will spend hundreds of dollars and feel fully repaid to see only one flock of sheep or a herd of elk for only a few moments.

The sprightliness of a scene which comes from the presence

of wild life in the outlook cannot be over emphasized. I recall the pleasant thrill I received while visiting the Yellowstone when a big black bear mother with two cubs came to the edge of the river opposite the road on which we were traveling and leisurely looked us over.

As I write, my eye glancing from the window of this



DOCUMENTARY EVIDENCE THAT BIG GAME MAY STILL BE TAKEN IN SOME SECTIONS. BUT THIS RANGER HAS MADE A BIG KILL AND SUCH SKINS AS HE HAS TO SHOW ARE A RATHER UNUSUAL SIGHT TODAY

home in the hills, spies a little chipmunk, his mouth stuffed with grass, springing from one stone to another. The very snap of his motions adds a twinkle of life to a field already pleasing with asters, golden-rod and black-eyed susans. It matters little then whether the life in the scene is a chipmunk, a heard of elk, a black bear or a camp-robber jay, the essential feature is the presence of flesh and blood living things in scale with the outlook. Greater outlooks require big game in numbers to be in proportion while more intimate ones may be livened by small animals and birds.

Forest lands that will be most used in the near future for recreation are the most accessible. On the edge of great areas that are still in a more wild state are broad stretches of land which have been used by local residents as hunting grounds for many years. Visitors too have stopped there because of the areas being readily reached. It is natural then that these lands first encountered and



HUNTING AND ITS ATTENDANT OUTDOOR LIFE APPEALS TO ALL SPORTSMEN AND IS THE MOTIVE FOR A GREAT USE OF THE FOREST LANDS. IT IS A FINE, CLEAN TYPE OF RECREATION, AND HAS AN ENTHUSIASTIC FOLLOWING

now the first to be used for recreation are not well stocked with game. The lack of wild game living in these areas reduces the recreational use directly in proportion to the aggregate return that might have been received by all visitors to this region in any given period if they had been able to see during this stay several species of the larger wild animals in their native homes.

Like the wild flowers that are prey of all recreation users who unthinkingly pull them out by the roots, even the lesser animals of the forest are disappearing. Chipmunks fall before the valiant rifle of some man out for a day of sport and a continual open season on squirrels and rabbits depletes their once plentiful ranks. In their place the timber squirrel and water ouzel are as important landscape values as a whole herd of deer.

So there is today a lack in some places of this livening of the view by wild things. Recreation grounds have their values in the total of the appeal they offer to the visitor. One great value is found in the presence of living game in the woods, not alone for the sport of hunt-



THE FALLEN MONARCH. HE WAS A BEAUTY OF A CINNAMON BEAR, ONE AND A HALF YEARS OLD, AND MET HIS END ON THE SIERRA NATIONAL FOREST IN CALIFORNIA

ing but for the use it may serve as interest points in an outlook. And it is a regrettable fact that the pursuit of game for sport has in many places reduced the presence of living game to a point where it no longer can be counted as an asset of any magnitude, economically, from a sport standpoint or in recreational value.

This is not in any sense an outburst against hunting in a general sense. No better fun can be had than a good clean hunting trip. There are still places where good hunting may be found and should be allowed with proper restrictions. The purpose of this is rather to call attention to a fact that has perhaps not been universally recog-



PHOTOGRAPH OF A CONY TAKEN BY GUARD HUPP NEAR TWIN SISTERS LOOKOUT STATION, ON THE NORTH PEAK OF TWIN SISTERS MOUNTAIN

nized. Game living has a direct landscape value and as such is a part of the recreation resource of the Forests. A live buck seen a dozen times a season by a score or more of people has a greater total value in the nation than a mounted head with dead eyes staring over a den full of skins, weapons and other mounted heads. Especially is this true in areas that are now more depleted of game than others for these are the areas that have been more used by man in the past and will be more used in the future for recreation.

All encouragement should be given to rational preservation and propagation of game animals in forest regions. The transplanting of large game from one forest to another where it formerly was plentiful but since has been killed out is worthy of universal commendation and the work done by the Forest Service in this field merits good support. The establishment of National



BIG GAME OF THE LONG AGO. THIS SHOWS A BUFFALO COW AND HER CALF, ONE DAY OLD, ON THE WICHITA NATIONAL FOREST IN OKLAHOMA

and State game preserves in those sections where game naturally propagates should be pushed more rapidly but only after a really thorough study of location of such areas is made. Too often local politics play no small part in the establishment of such a preserve. The service of the National Parks as game sanctuaries is of the finest sort and there truly one may see unafraid wild things. True sportsmen will welcome the work that will preserve species from extinction and will again stock the ranges where formerly game was plentiful. It is



THIS CAMP ROBBER IS MAKING HIMSELF THOROUGHLY AT HOME ON THE PREMISES. YELLOWSTONE NATIONAL PARK, WYOMING

only the "game-hog" who wishes to strip a region of all living wild life.

In the great recreational systems of the Nation are areas of many acres which will be used intensively for outdoor play. Those most used today and those which will be used more in the future now lack a great value that is found in the presence of living game. The establishment of game preserves and stocking of depleted ranges will add to these areas an element of life that will make no smaller part of the value in an area from a recreational standpoint.

When thinking of game do not always think at the same time of a high-power rifle. Think a part of the time of the fun of jumping a bunch of deer from an aspen flat and have them stand and stare at your intrusion before they trot away to another place of hiding. Think of the morning in the fall when the frost has nipped the aspen and has left a tingle in the atmosphere and the hike that morning which has as its outstanding feature the whirring flight of a flock of grouse. Live game has a charm, a grace that never is possessed by a dead carcass or stuffed heads, and the place it presents the greatest joy to the beholder is where it is truly wild and not trammelled by iron fences.

Game in forest land offers two major appeals to the recreation user. Hunting and its attendant outdoor life appeals to all sportsmen and is the motive for a great use of the forest lands for that type of recreation. But there is another feature perhaps little thought of but none the less present and important in the simple presence of living game in the landscape and there is little question but that the value of a live animal viewed by forest visitors several times during its life, has a greater aggregate worth in the recreation scheme than the same animal dead.

THE MASQUERADING MAPLE

THERE is one tree in the Arnold Arboretum which probably has been the subject of more good-natured disputes than all the rest of the foreign and domestic subjects in the big collection put together, says Mr. E. I. Farrington, in the *Boston Evening Transcript*. It is an exceedingly narrow tree, shooting straight up into the air, and with the branches hugging the trunk as closely as though they were strapped in that position. The argument chiefly indulged in by visitors concerns the identity of this tree, many of them contending that it is a Lombardy poplar, while others, somewhat more fully versed in arboreal lore, assert that it doesn't possess the characteristics of the poplar at all. The argument is not always settled even when the little aluminum label attached to one of the lower branches is read, because the words "*Acer saccharum monumentale*" may not mean much to the average person. Being interpreted, though, they disclose the fact that the odd-shaped tree is a sugar maple. It is often spoken of as the fastigate sugar maple, meaning that its growth is upright. It is, in point of fact, one of the narrowest trees known, and its appearance is strikingly distinct. Standing in a somewhat

isolated position, although within the maple group, it looks like a sentinel on guard, and is so tall that it is readily observed by motorists on the main highway. Not infrequently remarks about its unique character are made by those who pass by and glance over the vine-covered stone wall. The tree is fully fifty feet high, but only a few feet in diameter, and it looks so little like an ordinary sugar maple that it is difficult for anyone to realize its claim to imitate kinship with that well known New England tree.

The parent tree was found growing in a cemetery in Newton in 1885, and this, like all other similar trees now known, came as grafts from this Newton specimen, which seems to have appeared as a spontaneous freak of nature, it being understood that a natural freak is not always something unpleasant or amusing to look upon. This maple is really handsome, especially in the fall, when it takes on a brilliant coat of red and yellow. Trees of this form might well be substituted for the better known Lombardy poplar, for they have a much longer life, although not growing so rapidly. (See illustration shown on Contents page.)

FOREST FIRES IN NORWAY

ON June 19 one of the worst fires on record in the country broke out in the forest of Rendalen, Norway, about 180 miles northeast of Christiania. The fire started through the carelessness of some men who were in the woods. Swept by a heavy southern storm the fire spread rapidly over an extensive area.

Fifteen hundred to two thousand men, both civilians and military, fought the fire and for over fifteen hours their efforts seemed in vain, but, owing to the practical skill and tireless energy of these men, it was at last checked and then heavy rains setting in completely extinguished it.

The devastated area is estimated to be over six thousand acres and the damage is, unofficially, estimated to be sixty thousand pounds, sterling.

Other forest districts have been visited by fires lately, but on a more limited scale.

"TRIBUTE WHERE TRIBUTE IS DUE"

DESPITE the heavy turnover in recent years there is more genuine *esprit de corps* in the Forest Service than in any organization, public or private, of like size in existence. For fifteen years the Service has thrived on it and there have been times when it has had little else to exist on. *Esprit de corps* to the Service might be likened to the rim of the wagon wheel, taking the knocks and bumps as they come, warding off the rocks, yet holding the structure firmly together and leaving a clear-cut, squared-edged imprint in the roadbed over which it travels."—District 2 Review.

A CHINESE trust controls the dye used on fire-crackers, made from cibucao, a Philippine wood. The same dye is used for sealing wax and Chinese ink.

BLACK WALNUT FOR BEAUTY AND UTILITY

"IN connection with the most commendable campaign of memorial tree planting being so effectively conducted by your Association," says C. A. Reed, nut culturist of the Bureau of Plant Industry of the United States Department of Agriculture, in a recent letter, "may I call attention to the special fitness of the black walnut for such planting, for two reasons; its usefulness and value as a tree and because of the important part it played in winning the war?"

"The black walnut is one of America's most useful trees. It is also one of the most widely distributed species, being found either native or planted from Middle New England to Northern Florida and from Montana to Texas. West of the Rockies and in the Southwest, wherever conditions of soil and moisture are favorable, relatives of the Eastern black walnut are among the more common indigenous species. The Eastern black walnut has been very successfully trans-

planted to the same sections, where it freely hybridizes with the ones already there, resulting in a very interesting type of crosses. In the interior valleys of California not infrequently brief stretches of macadam or concrete highways are shaded by rows of handsome trees either of the pendulous California black walnut species or of the typical Eastern black walnut or of the more vigorous and luxuriant type which is the offspring of these two when crossed together. The native black walnut is the

only member of the *Juglans* group which has thus far proven its adaptability to any considerable portion of the United States.

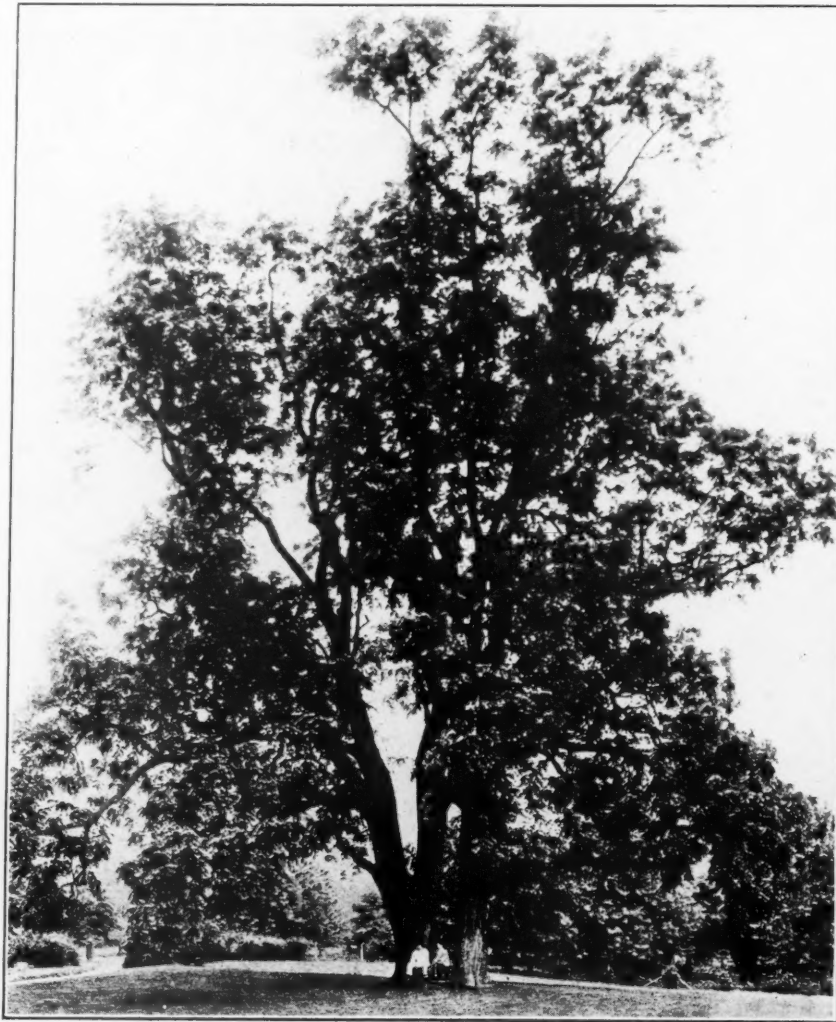
The Persian or so-called English walnut annually produces a crop on the Pacific Coast valued at from ten to fifteen million dollars, but east of the Rocky Mountains it is of little importance, succeeding only under the most favorable conditions in certain restricted localities.

The Japanese walnut is dwarfish in habit of growth, and while it has a wide range of adaptability and certain other commendable characteristics it rarely grows large enough to make a desirable shade tree.

"In time of war the black walnut, especially the Eastern species, is one of the first to be called into active participation. Indeed, we are informed that for many years before the recent conflict the German Government stealthily drew upon the American black walnut for gun stock material. During the period of American participation

this species not only took part in the making of gun stocks but also in the manufacture of airplane propellers, which proved to be a far more important use. Walnut shells were used in the manufacture of carbon for gas masks, and to an unknown extent the kernels of the nuts were among the delicacies sent from home to the boys at the front.

"Both on the land and in the sky the black walnut played a most important role. It was probably employed



A MAGNIFICENT SPECIMEN OF THE EASTERN BLACK WALNUT

This tree stands in Montgomery County, Maryland, and is believed to be over a hundred years old, and the largest of its kind in all the surrounding country. Fortunately; it was not called upon for "war" service.

in a greater variety of ways and for special purposes more exclusively than was any other single species. It may well be ranked with the heroes of the war, and as such it should not be forgotten in connection with the monuments being established for those who did not come back. So well did it perform its duty, and so important was its duty, that it might appropriately be called the Liberty tree.

"On the beautiful capitol grounds in Sacramento, California, there is a group of trees set out because of their historical interest. There is a red maple from Antietam, Maryland; a white elm from near McKinley's tomb, Canton, Ohio; a white ash from Vicksburg, Mississippi, and many others from equally distinctive points. These trees are studied with surpassing interest by visitors from many states and foreign lands. Could anything be more befitting to the memory to a fallen soldier than to plant a walnut tree grown from a nut produced at such historical points as these?

"There is a popular prejudice that the black walnut is a slow grower, but the fact is that in fertile, loamy soils



A MAGNIFICENT AVENUE OF BLACK WALNUT AT CHICO, CALIFORNIA

The native California black walnut is often effectively used along roadways and private driveways on the Pacific Coast, as its pendulous beauty gives dense and grateful shade. This is a beautiful planting.

in the Mississippi Valley. It is perhaps most common in the States of Kansas and Missouri, east to Michigan, Ohio, Kentucky and Tennessee. Splendid specimens are

reported from Western North Carolina. Records and photographs are on file in the Department of Agriculture offices of individual trees on Long Island and on what is known as the Niagara Peninsula of Ontario, not far from Niagara Falls, which have trunk diameters at breast height of from three to four feet. Equally large or even larger specimens could doubtless be found in



THE BLACK WALNUT—FRIEND OF MAN BY THE SIDE OF THE ROAD

A beautiful tree for roadside planting. This is the Eastern form and it is one of the most widely distributed of America's better class of native trees. With fertile soil and congenial climate, single specimens often develop trunk diameters of from three to four feet at breast height.

many other localities. During recent years nut tree nurserymen have developed and are now propagating three promising varieties of the Eastern black walnut. These are the Thomas, Stabler and Ohio, from Pennsyl-

underlaid with firm but not overly hard clay subsoils, moist yet well drained, it is one of the most rapid growing of America's more valuable forest trees. It should never be planted in coarse, gravelly, stiff heavy clay, or thin sandy soils. Preferably it should have only the most fertile soils, such as are typical of the alluvial sections

vania, Maryland, and the State after which the last was named, respectively. The first was brought out during the early 90's, and where given intelligent care and attention it has produced liberal crops of nuts. The Stabler and Ohio are new sorts, but both are showing remarkable evidences of early bearing. All of these varieties are handsome in habit of growth, and have fine and rather dense foliage. The nuts are of average size and quality. Their chief point of superiority lies in the ease with which the kernels may be released from the shells after the nuts are cracked by ordinary methods. A very high percentage of the kernels may be extracted in unbroken halves. Frequently kernels of the Stabler are removed intact.

"Wherever the black walnut will succeed, it can be planted with entire propriety in private lawns,



THE CALIFORNIA BLACK WALNUT

The majestic beauty of this tree, as well as its high utilitarian value, is responsible for its selection as one of, if not the representative American tree. The planting of walnuts is earnestly urged.

public parks, along highways, in fence corners on the farm, and about farm buildings. Except for timber purposes, they should under no circumstances be planted nearer than twenty-five feet in any direction from large trees, and unless other trees nearby are to be subsequently removed, the young walnuts should be allowed fully fifty feet.

"Where nut production is desired, budded or grafted trees of the improved varieties will be found much more satisfactory than will seedlings or unbudded trees. Trees of the former type are available from but a few nurseries only. When they cannot be had, well grown seedlings three or four years of age and from three to six feet in height above ground may well be used. If for any reason trees of this class cannot be had, it will do to plant plump-meated nuts where the trees are to be grown. They will not all succeed, but if enough nuts are planted some trees will undoubtedly result and the returns will be incalculable. In transplanting the tap-root can safely be cut from two and one-half to three feet below the surface.

"It is not probable that the Forestry Association will need to be reminded of the importance of the part in winning the war placed upon this species by President Wilson, when he officially called upon the Boy Scouts of America to locate black walnut trees suitable for logs wherever they might be found. Surely readers have not forgotten the part the FORESTRY Magazine took in advertising the call and in recruiting the black walnut for duty overseas. Let us have more black walnut trees as memorials, not only to the men, but also to the trees which went to France and did not return; also let us have more of the spirit of the late Governor Hogg, of Texas, who, when on his death bed, expressed the wish that no monument of stone be erected to his memory, but that a walnut tree would be planted at the head of his grave and a pecan at the foot, and that when the trees matured and bore nuts they might be planted by the children of Texas, in order that there might be more trees and Texas a land of trees. While we are planting let us select useful trees best suited to our locality."

IN THE PINE WOOD

Where the pines make network
Of arms across the sky,
Here, dear love, the place to live,
Here, dear God, to die.
Blue the heavens sift to me,
Soft the wind sings of the sea,
Life is incense—Earth is good—
In the deep primeval wood.

Where trees hold attainment
Of growth up to the sky,
Home I come from crowded streets
When toil lets me by;
Here, dear love, we know life best.
When death comes to bid us rest,
Let us sleep where silence trod
Through the woods to speak with God.

—Edith Livingston-Smith.

HOW A FOREST SERVICE MAN GOT RICH

HE started poor as the proverbial church mouse ten years ago. He has now retired with a comfortable fortune of \$50,000. This money was acquired through industry, economy, conscientious effort to give full value, indomitable perseverance, and the death of an uncle who left him \$49,999.50."—*Laboratory Bulletin*.

THE appointment of T. W. Norcross as Chief Engineer of the Forest Service, has been announced by Colonel W. B. Greeley, Chief of the Forest Service. Mr. Norcross succeeds Mr. O. C. Merrill, who resigned a short time ago to become Executive Secretary of the Federal Power Commission.

THE USES OF WOOD

WOOD IN THE TOY INDUSTRY

BY HU MAXWELL

MANY toys are made partly or wholly of metal, rubber, or celluloid, yet the use of wood for that purpose shows no tendency to decrease, but it probably increases from year to year in this country. The principal consideration which holds wood in its place as toy material is not cheapness, though that has something to do with it. Articles of large size would be too heavy if made of cast metal, and if of sheet metal, there is constant danger that the raw edges will become exposed and cut the hands of the child that plays with the toy. Many articles are made of wood because it is best, irrespective of cost or weight. Sleds are a good example of such. Some very handsome and serviceable sleds are of metal, but a visit to toy stores in winter will show that dozens of wooden toy sleds are sold to one of metal.

The story of this industry, told by statistics, is instructive. The following list gives the woods and their amount used annually in the United States in the manufacture of toys:

Wood	Feet Used	Wood	Feet Used
Basswood	8,739,242	Red gum	523,000
Maple	3,964,400	Cottonwood	257,000
Beech	3,221,506	Hemlock	241,000
Birch	3,123,950	Cypress	150,000
White pine	2,367,131	Sycamore	91,343
Elm	2,042,055	Butternut	10,000
Oak	1,444,057	Tupelo	5,000
Chestnut	966,268	Cherry	2,000
Ash	895,300	Spruce	1,300
Yellow poplar	882,000		

Total28,926,552

At first thought, it might seem that toys make up an aggregate mass, a miscellaneous collection without rank,

order, or division, yet this is far from the fact. Toys fall into groups. The groups are not many, and the distinctions between them are pretty clear. Children are the arbiters of toy kinds and styles. They imitate what they see around them and toy makers recognize this fact and conform to it. At school the child sees objects of a particular kind and learns their use. The manufacturer supplies what the child wants by making a class of objects which may be designated as *educational*.

Another class, imitating things seen in real life, is recognized as *architectural*.

A third has to do with trades and the tools and machines for carrying them on, and toys in that line are listed as belonging to that class.

A well defined group is based on the use of *musical instruments*.

Boats, rafts, canoes, and such things as float and are useful have been responsible for toys based on *water craft*.

Children are familiar with furniture and they early recognize two classes, one for the kitchen and one for the living room, and these go under the list of *furniture toys*.

Animals, birds and creeping things form another class grouped as *natural history*.

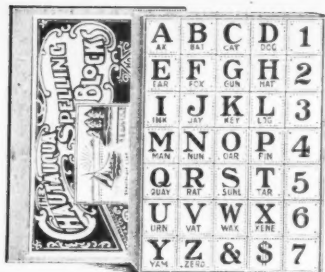
Still another kind which is clearly defined is very common, and it belongs in the list of *games and amusements*.

Each of these classes is entitled to special consideration, for they show the lines along which the child thinks and acts. The schoolhouse and its furniture



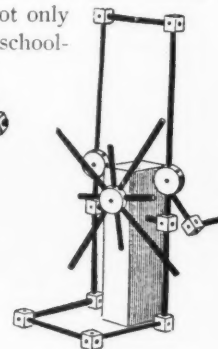
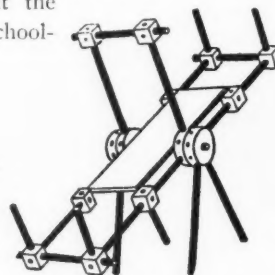
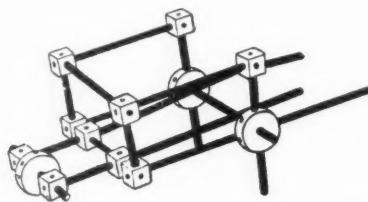
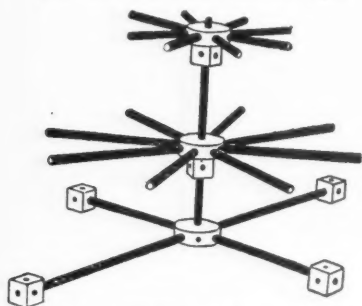
THINGS THAT ROLL

It is easily seen that the toys which are passing through this factory are intended to do much rolling as part of their duty in furnishing amusement for children in all parts of the country, and the story of how they are made is a very interesting one.



THE DELIGHT OF THE ABECEDARIAN

The A B C blocks and the children's work bench go together in providing work and play, and the beginnings of education. The outfit depends almost wholly upon wood, for nothing else has been found to take wood's place. Blocks are of basswood, red gum, tupelo, white pine, cedar and others that are light.

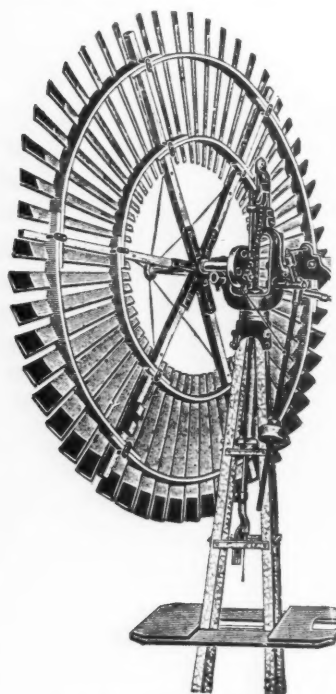


TOYS FOR BUILDING

Nothing is better than wood as material for toys intended to teach the art of building. Such toys afford amusement to the child and at the same time teach useful habits and create a desire for knowledge of more important things in the affairs of life. Children are natural builders.

and apparatus are successfully imitated by the manufacturer of wooden toys. Most children who enjoy toys of that kind are not much, if any above the primary grades. The desk and the blackboard appear to be most frequently copied, and they are made in all sorts and combinations. Charts, of course, come in for liberal consideration, with their maps, pictures, and numbers, all patterned after the real objects that do service in the school-room. Sectional maps which are made by pasting on thin blocks of wood, cut in proper shape, maps printed on paper, are popular and possess considerable educational value, for the child is expected to fit each section in its appropriate place. But this toy comes above the primary grade. Rulers, erasers, and chalk boxes, all in miniature, go with the charts and black-

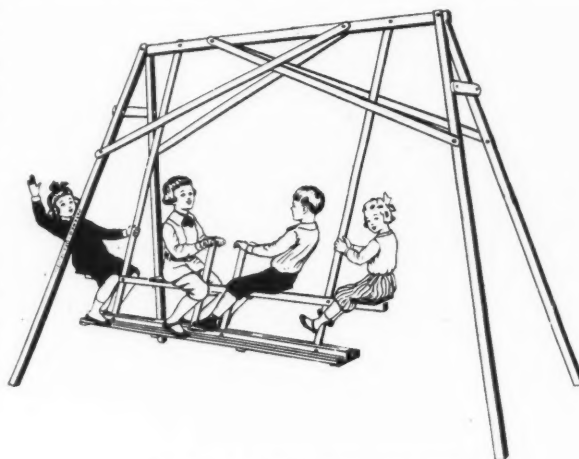
boards. Devices useful in learning the simple principles and fundamental operations of arithmetic are numerous, consisting generally of geometrical blocks. The young child amuses itself with these and gains some knowledge of their names and shapes. The abacus, a toy useful in learning addition, subtraction, multiplication, and division, is a favorite with children who find amusement while they learn arithmetic by the Chinese method. Some of the more pretentious toys based on the child's interest in school, are complex and include not only the furniture and appliances in the school-room, but the entire school-



AN IMITATION WINDMILL

A toy windmill may run by the force of the wind or it may not; but it affords amusement, and that is one of its chief purposes when it comes into the child's life. It suggests scenes on ranches where the wind blows and where horses and cattle roam at will about the ranges, and everything is outdoors.

house, outside and in, with the pedagogue at his desk and the classes before him. The complete schoolhouse just described might fall in another class which may be designated as architectural, for toys of that kind are intended to illustrate house and similar structures. Wood lends itself exceptionally well to toys of this kind. The structures are often made in sections, and the children find both amusement and instruction in placing the various parts together. The field is wide and the toy maker has fully occupied it. Nearly all kinds of structures have been copied, from the simplest footbridge or hut to the elaborate capitol and castle. Windmills are modeled upon the clumsy and archaic originals of Holland, and water-



THE LAWN SWING FOR CHILDREN

This is one of the larger toys in which children find amusement. It is not restricted to any particular size or age of the child. Except a few bolts and screws, the article is made wholly of wood, and a little paint adds the finishing touches. The toy maker puts to use many scraps of wood which otherwise would go to waste.

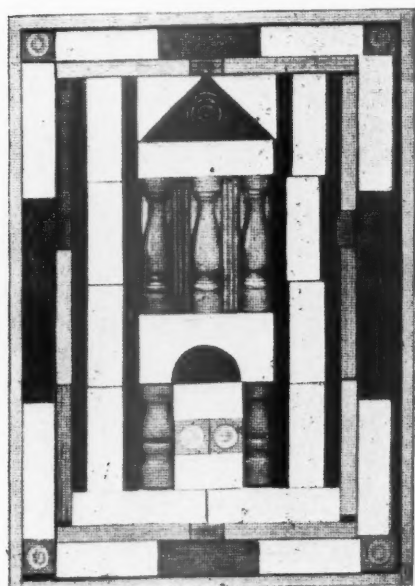
mills are built like the old frontier affairs, once common but now rare. Farm houses, barns, granaries, and other buildings suggest country life; and the counterpart of these is the village, with its streets, schools, churches, and stores. The railroad station, the wharf, the tunnel, and the bridge are duly copied or imitated. They are sometimes placed in the child's hands in complete form, but usually they are in blocks, and the child sorts out the blocks, fits them together, and constructs



A CARRYING CASE FOR TOOLS

The boy sees a workman carrying a tool chest and he wants one for himself. Boy Scouts are the greatest tool carriers among children. The chest here shown is designed for carrying. It is of chestnut wood which is light, attractive in appearance, and has all the strength needed for practical purposes.

the objects in their entirety. He thus has the double pleasure of building and of seeing the work after it is done. The toy maker studies carefully the psychology of the child, and instruction and amusements are provided in healthful proportion. Styles of architecture are worked out in wood, finely shaped and nicely fitted. Norman towers, Gothic arches, Greek columns, Egyptian doorways and temples, Turkish minarets, Hindu pagodas, and the sagging roofs of Chinese edifices are all shown in the list of architectural toys. Color schemes are not overlooked and woods of different tints and shades are combined to give pleasing effect to finished buildings. The child's contact with work as it is carried on about him every day, sharpens his desire for something in imitation of the machines employed in trades and in business. Wagons are the most common objects in real life, and the most common in toyland. In size and fashion they are almost infinite, but every one is a model or an imitation of a vehicle used for business or pleasure. Though a toy cart may not weigh a quarter of a pound, it is intended to be a copy of a real vehicle. It is so with all sorts of little wagons.



TEACHING ORDERLY PLAY

Toy makers are generally careful to provide both the toys and a place in which to keep them; for it is a good business proposition to make the toys popular with parents as well as with children. That result is reached by providing a place for the playthings when not in use, thereby keeping them out from underfoot.

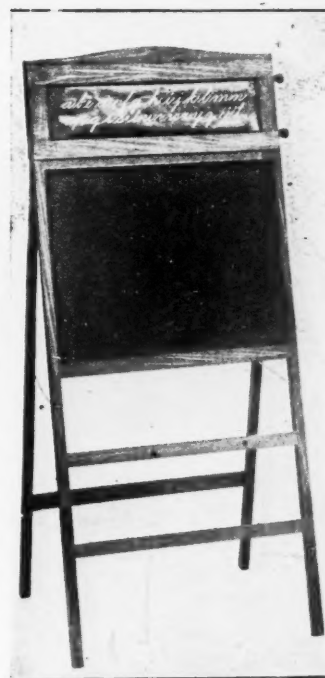
These are modeled after the delivery wagon which the butcher drives, or the grocer's, the express, or the heavy truck, and it would be difficult to find a child with a wagon who could not tell what kind it is. Most toy wagons are of wood, but it does not appear that the toyman has yet succeeded in making a wooden automobile, though he has provided railroad locomotives wholly of wood, from tender to cow-catcher; but they are not made to do much running under power other than a push or a pull. Fire fighting outfits lend themselves readily to wooden imitations, and toyshops are full of them. The engines are generally of metal, but the ladders and carts are of wood. Toy makers study the wants of the village or city child, rather than of those of the rural districts. That is doubtless because the largest sale of toys is in towns. The surroundings of country children may have something to do with the relative smallness of toys there. They need fewer artificial playthings because they have more real ones, such as lambs, cats, ducks,



FOR THE KINDERGARTEN CLASS

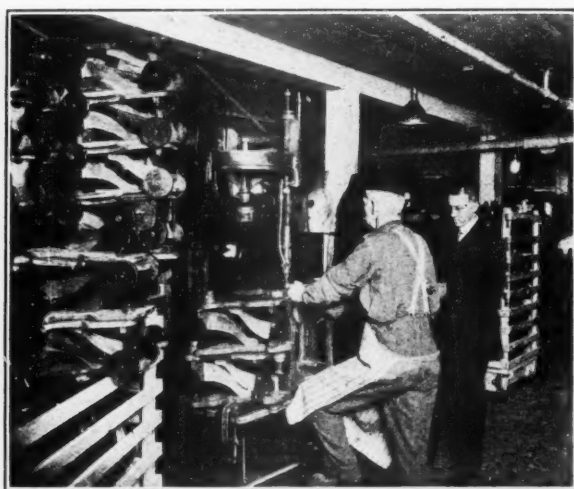
Toy furniture may be highly useful, and a pretty large class of that kind is on the market and evidently finds buyers. It is a sort of connecting link between the home and the school. The principal difference between it and regular furniture is in size. Similar patterns and like materials prevail in both.

Children do not always get as much blackboard at school as they want, and they make up the deficiency by equipping the play room at home with models somewhat like the real boards at school. The toy boards are of smooth, fairly hard wood that holds paint well and wears in a satisfactory manner.



A BLACKBOARD FROM TOYLAND

colts, calves, and real wagons and sleds in which they are privileged to ride with real horses to pull them. Toy tools are made more for the town child. The rakes, hoes, spades, lawnmowers, snow shovels, and hatchets are such as the town child sees about the yard and garden. No toy store exhibits miniature plows, harrows, cultivators, fanning mills, seed sowers, threshing machines, corn shellers, horse rakes, hay tedders, and other farm machines now so common in all rural communities. The reason why they are not made is that city children do not know what such things are, and would not buy them; but they are well acquainted with yards and gardens and take readily to tools the use of which they know. The same idea is carried out by the toy manufacturer in making barns and stables. They are such as are found



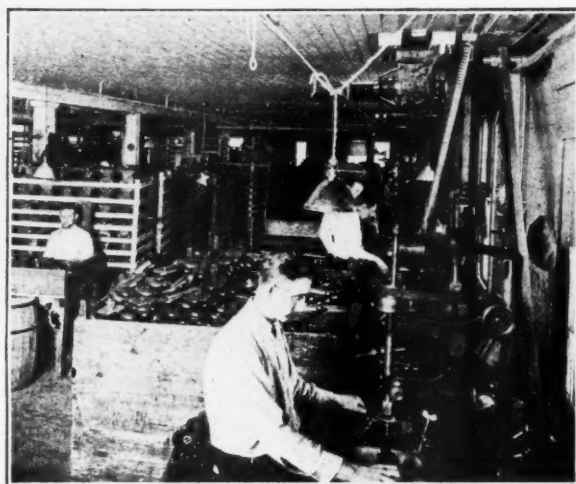
DRIVING SCREWS BY MACHINERY

Business comes before pleasure in the toy business, for while the toys are intended for pleasure after they reach the hands of the children, the manufacturing comes first, and that is a matter of the most serious business. Observe the power screw drivers.

in the city, not on the farm. The stores are full of toy stalls that hold one or two cows or a single horse, with the small hayloft above, and the small grain bin at the side; but the country barn with its more ample mows of hay, larger and more numerous stalls, and the dairy with its rows of stanchions for cows, are not found.

The list of wooden toy musical instruments is not long, for metal holds principal place, yet large numbers of a few kinds are made. Pianos lead, and toys of that kind range in size from the smallest that can be made to emit a sound from a vibrating string, up to instruments which approach the line which separates toys from real pianos. Wood, by its rigidity, lends itself well to taut cord instruments. A common one is the violin, and harps are occasionally seen. The wooden whistle, though it cannot justly claim to be a musical instrument, is quite common and is a favorite with children. It is made in styles almost innumerable, and the toy maker has exercised his ingenuity in producing tones and noises as numerous as the styles. A common class of toys which pretend to be musical, are based on the resonous qualities of small bars of dry,

straight-grained wood, when struck with mallets. A modification of the whistle becomes a kind of flute or fife, formed of a wooden tube with a few stops and keys. The lowest in the scale of toy musical instruments is the rattle, a kind of forked stick with a clapper, modified in various ways to increase its range of tones, but all more or less distressing to adults, though highly delightful to children. Wood floats, and the toy inventor naturally turns to it as the material for all kinds of craft that ply on water. He has a wide range of subjects to pattern after. Noah's arks are favorites with children, and so numerous are the styles turned out that Noah himself would fail to recognize them as copies or imitations of the original, if such a thing as parading them in review before him were possible. Some toy vessels are skillfully made, and are graceful objects; but it is not so with the average Noah's ark in the toy shop. It is usually loaded with animals totally out of proportion to the size of the vessel, and so top-heavy is the craft that, if one like it were to attempt the deep, it would capsize so suddenly that the animals on board would quickly find themselves swimming for their lives. However, the number of such toys sold indicates that chil-



POWER DRILLS AT WORK

Toy makers in Europe do nearly everything by hand, but that process is too slow for the American toy factories. The kiddie car maker is here shown using the most up-to-date drilling machine to be had. That is a necessity in quantity production.

dren like them, and this proves the good judgment of the manufacturers who make them. Vessels more modern than Noah's ark are generally constructed on more correct, scientific principles by the makers of toys. Some are designed to float and they do it very nicely in ponds or rain puddles where children try them. Usually, however, toy vessels made for the water are of the smaller kinds, such as skiffs, canoes, catamarans, and whaleboats. The European war brought in the submarine as a popular model for toys. The small boats are usually cut out of a piece of solid wood, and the painter tries his skill on them. Paint on such toys serves a double purpose. It looks well and it keeps the wood dry and light. Most

toy boats are not intended for actual journeys on water, and if the child attempts to navigate them he is liable to meet disappointment when he sees them careen upon their beam ends, or perhaps whop over and float keel up. The kinds of boats that come to children from toyland are nearly as numerous as the carts and wagons. There are dugouts, canoes, skiffs, lighters, whaleboats, canal boats, barges, scows, dhows, yachts, schooners, steamers, and war vessels. In some of these a good deal of metal is employed, but others are wood.

Toy furniture is made in almost endless variety, yet it falls into two general classes, that suited to the living rooms, and that designed for the kitchen, laundry, and pantry. The makers find their models for both kinds in furniture stores, for the child is pleased with a copy of what he sees around him. Toy furniture is nearly all made of wood. It is produced in natural finish, or it is painted, varnished, fumed, or stained, exactly as real furniture is finished, but the toy is necessarily a cheap imitation. Some is of regular furni-

ture woods, oak, birch, maple, cherry, basswood, mahogany, and gum, but a larger part of cheaper wood, like pine, fir, and spruce. Upholstered toy furniture is not common, because it is not much in demand. It is easily soiled and spoiled. For that reason, high grade parlor

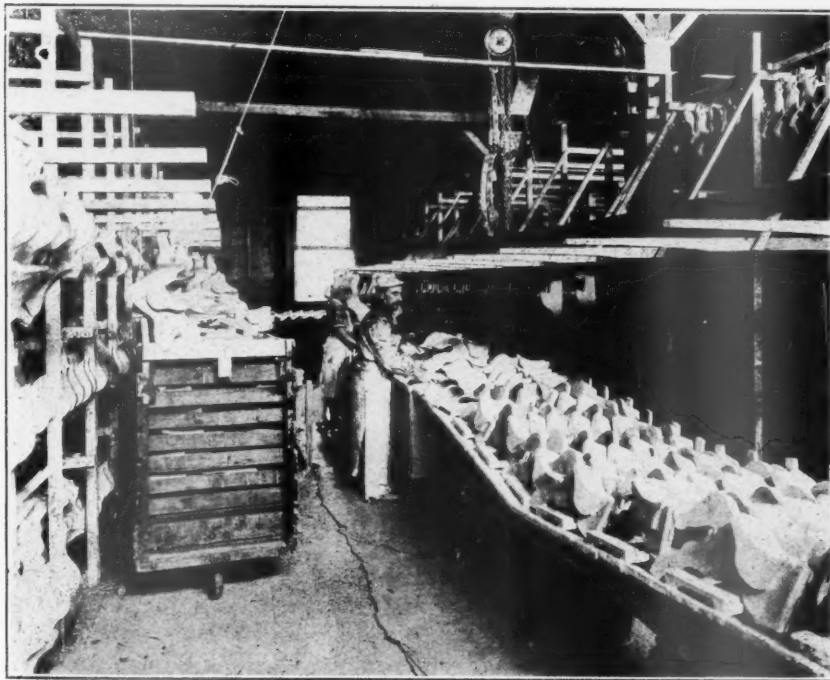
furniture is not much imitated in the toy shop. Bedroom and library suits are most popular, including tables, stands, chairs, bedsteads, dressers, chests of drawers, bookcases, and rockers. A class somewhat distinct from this is camp furniture, and pieces for porch, garden, and lawn. Some of the outdoor styles are strictly rustic, made of poles and pieces with the bark on. A considerable part of toy furniture is sawed in solid pieces from blocks, the principal tool for this work being a scroll saw. Articles of this kind are small, only a few inches high, while some of the other furniture classed as toys is of sufficient size to give it use. Therefore, the separating line between real and toy furniture is not always clearly drawn.

The second division of toy furniture and woodenware belongs to the kitchen and laundry, and here are again found faithful



ROUGH MATERIAL FOR TOYS

Measured and cut lumber constitutes one of the first and most important steps in the manufacture of toys, for without a good beginning it would be difficult to secure a satisfactory completion of the article which is to amuse and instruct the child.

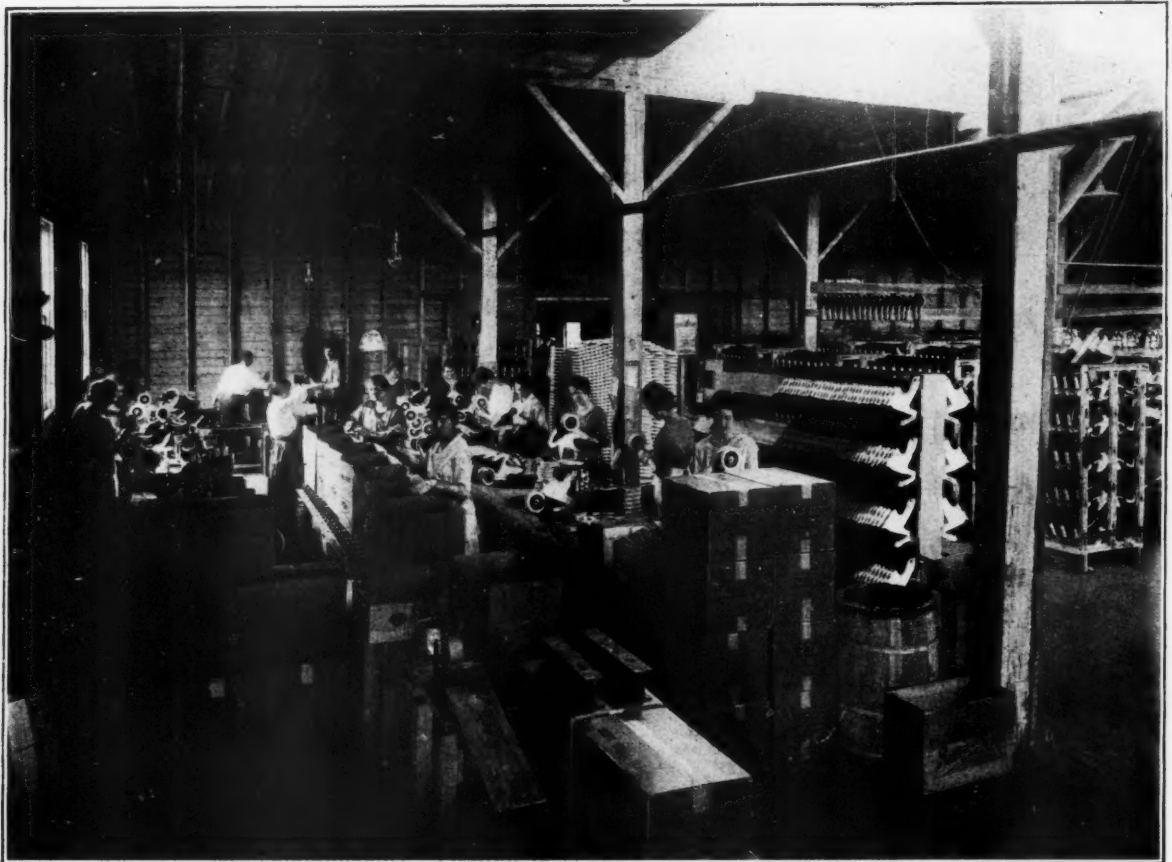


BEAUTY PARLOR IN A TOY FACTORY

Paint is a pretty important thing in a toy maker's shop, for one thing is always held to be important, and that is that the finished articles must look nice, and nothing can take the place of paint in adding this highly essential quality.

copies of articles in the home. Plain wood is seen almost exclusively here, with little attempt to ornament or decorate. The idea of use prevails. Everything is for a purpose. There are coffee mills with which children can pulverize dry bread crumbs, bread boards, rolling pins, biscuit cutters, flour scoops, dough trays, and other utensils for pastry making. Meat pounders, chopping bowls, cream freezers, churns, butter molds, spoons, and paddles fill a large place in the child's domestic science. The more pretentious articles like ice boxes, cupboards, bread boxes, and sideboards, keep up the faithful imitation of what is found in well appointed kitchens and

most of these creatures, the imaginative toy maker exercises his genius in designing and producing strange and uncouth caricatures of some of them, and makes others of form and features never seen on sea or land. Wood is the common material of this kind of toys; few are of metal or rubber. Jointed reptiles, birds, and amphibians, mounted usually on wheels, are so constructed that when trundled along, the body is made to move in all its articulations. This style is popular with children, and the toy artist employs abundance of bright paint to heighten the effect. Generally, toy animals of wood do not show much art. If not grotesque, which most of them are,



NEARING THE JOURNEY'S END

A few more finishing touches and these toys will be through the factory and ready for the shipping clerk. The stacks of empty and filled boxes indicate that the last stage in the shop has been reached and the hour for going is in sight, and one may imagine they are anxious to be on their way—for their mission is a happy one—to bring joy to children's hearts.

pantries. The child must have its laundry and the toy maker has provided the tubs, wringers, washboards, clotheshorses, mangles, and ironing boards. These articles are generally made in sizes sufficiently large to be of some service in laundering the soiled linen of dolls.

Children are interested in animals and in all harmless things that run, fly, crawl, creep, swim, or walk, and the makers of toys have done some of their best work in that field. So numerous are the objects represented by toys that a list would supply a rollicall for menageries, zoological gardens, aquariums, aviaries, and barnyards. Not content with true representations of

they are apt to be crude. This is doubtless owing to the low price at which they must be sold, for the purchaser of toys is seldom willing to pay the price necessary to procure a piece of respectable wood carving. Therefore, the animals are the product of jigsaws, gimlets, pegs, and paint brushes, or of a turning lathe and an auger. One popular style of animal toys consists of six pieces for each individual—head, body, legs. These are fitted together with auger holes and sockets, and the minor appendages, such as ears and tail, are tacked on. An attempt to paint these to show the animal's natural colors, gives them more educational value than some of the



PACKING FOR THE TRADE

And now the toy is complete. Somewhere in every toy factory is a room where the finished articles are brought together preparatory to sending them out to the final buyers, and the maker of wooden boxes and crates is here a man of importance, for he makes the shipping possible.

others have, which are bright green, yellow, blue, or red, which are colors not given by nature to any four-legged creature.

All toys are intended to furnish amusement, which is their primary purpose, but those heretofore described are based on resemblance to real objects which are possessed or employed by grown people, and to that extent the toys are educational or imitative. There are toys, however, which are intended to furnish fun and recreation, without regard to labors, trades, machines, or occupations of grown people. Some of these, it is true, are copied from recreations which parents find enjoyable; but the basic idea is amusement. Many sorts of games are in this class, and there are few harmless amusements indulged in by adults which are not remodeled to suit children. Among such toys are scenic railways, toboggans, tennis, croquet, ninepins, bowling, circus fixtures, dominos, checkers, chess, quoits, leap frog, and many more.

Sleds seem more properly to belong here than in the class with wagons, because a child's sled is strictly a thing to give amusement. Bows and arrows come

under this caption also, and target artillery, all of which the toy manufacturer supplies. Rocking horses with all their modifications, including rocking goats, bears, and camels, and dozens of others, fall in the same class. Toy pool tables are almost a class by themselves, because their range in cost and size is so wide that it is difficult to draw the line between the toy and the real article. They belong to the most expensive class of toys, and they are sold in immense quantities.

Many of the toys sold in this country are made in foreign lands. Before the war Germany made a large part of the wooden toy mechanisms, such as jointed animals and building blocks for toy houses and other edifices. Other classes are manufactured

in this country, among these being sleds, wagons, and tools. Handmade toys are comparatively rare, except that a good deal of the finish is done by hand, and all of the assembling of parts after they have been shaped or finished by machines. So



READY FOR SHIPPING

Not a shaving of wood or a scrap of paper is in sight to indicate that the packing of these toys has been finished and that these neat boxes each carries an object dear to the heart of some child. Let the imagination follow these boxes to their journeys' end.

numerous are the kinds of machines in use by toy makers that any minute description is impossible, and a fairly complete list is difficult to compile. The scroll saw and the lathe do much of the work, but many special tools are in use.

It may be stated as a general fact that American toy makers use hardwoods and those in Europe prefer softwoods, like pine, fir, and spruce. Sleds, which are largely of American make, are of maple, oak, birch, ash, hickory, and of several other tough woods; with pine or some other softwood for the body, or the board which forms the top. There is a class of toy animals covered with felt, wool, cotton, or some other fibre, which may be

mounted on wheels. These have been chiefly of European make, and the wood, if concealed, is of poor grade, and it is often knotty even in the exposed parts. Toy wagons of the larger sizes are of tough woods and are made to stand considerable rough usage. The bodies are generally of pine, hemlock, cottonwood, or yellow poplar. Toys do not demand expensive woods, except in certain kinds where much use is expected, as with sleds and wagons. Certain parts of rocking horses should be of hardwood to give the requisite strength. The waste problem in toy making is not serious, because most of the pieces used are small and what is not suitable in one place may fit in another.

AUTHOR'S NOTE: The illustrations for this article were secured from various sources, but special credit for them is due to The Gould Manufacturing Company, Oshkosh, Wisconsin; The American Manufacturing Company, Falconer, New York, and The H. C. White Company, North Bennington, Vermont, all manufacturers of toys, to whom grateful acknowledgment is made.

VOCATIONAL FORESTRY EDUCATION

BY JAMES B. BERRY

PRIOR to the World War the vocational movement in the United States had been slowly taking form. School surveys in various parts of the country disclosed the fact that 90 per cent of the children left the elementary school without preparation for any definite job. Many of them entered what may be termed "blind-alley" jobs—places in the industrial world which offered neither preparation nor hope for the future.

But with the passage of the Vocational Education Act (Smith-Hughes) in 1917, a new impetus was given vocational education.

The instruction work in vocational forestry under this bill is divided between the fields of agriculture and of trades and industry; farm forestry and silvicultural subjects being considered a part of agriculture, wood-working, paper and pulp, timber treatment and similar lines being classed with trades and industry. For this reason the two phases of forestry will be considered separately.

In the field of agriculture the subject of farm forestry enters as an integral part of the course of instruction in vocational agriculture. During the past three years this work has developed rapidly as a vocational department of the high school, thousands of new departments being established each year. The boy may select a woodlot enterprise at the beginning of the school year during which he has his instruction in farm forestry. As the instruction progresses he develops his project study plan and decides upon the various operations needed to put his home enterprise into productive condition. He is then in a position to go into the woodlot and carry out in practice the provisions of his plan. It should be borne in mind that the supervised practice is a teaching method—learning by doing—to supplement the class-room instruction. Along the line of major enterprises in farm forestry there have been suggested the following: reorganization of the farm woodlot on a productive basis; the planting and management of waste lands; turpentine production for the South; maple syrup production

for the North; basket willow growing; the production of nursery stock.

Minor enterprises are those which may be considered supplemental to major enterprises. For example, the treatment of fenceposts may form part of a fencing job in connection with an animal enterprise. The following minor enterprises are suggestive: the planting and care of shade and roadside trees; the preservative treatment of fence posts; the planting of a windbreak about a pasture or orchard; pruning and control measures for tree pests.

That the practice of forestry in the United States will be promoted as a result of the vocational education in agriculture must be admitted. To what extent, it is difficult to foretell. The possibilities are very bright, however. The obstacle to the progress of forestry has been the hard-headed lumberman who had no interest in forest production. Now there is an opportunity to work with the coming generation and, through the children, to reach the parents. This has been the key-stone to success in agricultural education and will prove of no less value in promoting the practice of forestry.

Several forms of schools have been developed in connection with education in the trades and industries; namely, the day industrial school, the part-time school, the continuation school, and the evening school. Of these the part-time and evening school types will prove most adaptable to the industrial education in forestry. Under the part-time system two boys hold the same position—working alternate days or weeks. The teacher is the instructor in the class-room and the supervisor in the mill. The evening school is adapted to the needs of men already in industry who desire to prepare for advancement in their vocation. In connection with the paper and pulp industry either type of school may be developed, although the part-time school will serve the needs of boys of 14 to 18 years to better advantage than the evening school. In fact, many states now provide by

statute for the part-time education of children between 14 and 18. The same is true also of the sawmill and wood-working industries, and there is no reason why an evening school should not be developed in connection with every large wood-working establishment in the country.

Perhaps the best plan under which to carry on the vocational work in lumbering, surveying, cruising, wood manufacture and paper making would be for several teachers to work out from the State Forest School. If a short course of three months were thought advisable, one teacher would be able to conduct four schools during the year. Experts in the various phases of forestry might, under such a plan, be detailed from the United States Forest Service to different states to assist in these schools. The result would be a widening field of activity for the Forest Service and the State Schools, and would do more than any other factor to promote forest production and wood conservation in the United States.

"UNCLE BILL" SAYS "PLANT BLACK WALNUT"

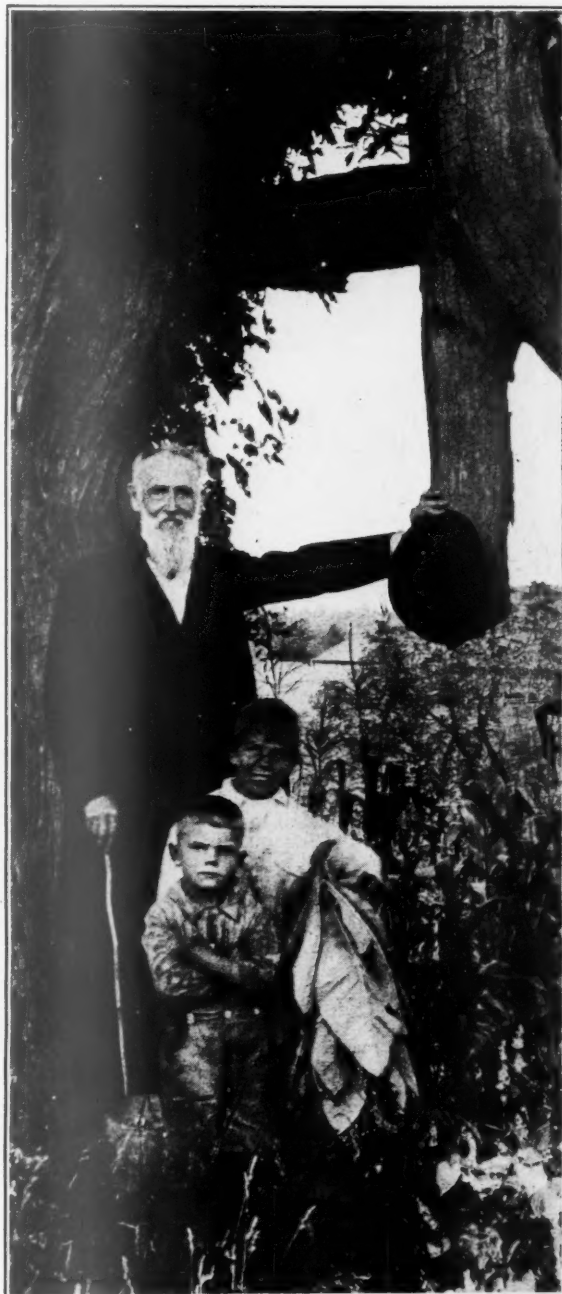
COLONEL CROSBY, of Washington, D. C., better known to the Boy Scouts as "Uncle Bill," is devoting the "best" years of his long life to getting the Scouts and other boys and girls to plant some black walnut on the home place. He grew up in the magnificent hardwood forests east of Columbus, Ohio, where his boyhood was spent in the companionship of trees, which he has never lost.

During four years in the "Sixties" as a soldier boy in Virginia, Alabama, Georgia, Kentucky and Tennessee, and since as a business man and newspaper correspondent, he has continuously been a student, an observer, and writer about trees. "The black walnut," he says, "for stateliness and beauty has no superior and few equals. In point of general usefulness and utility it has no equal among the trees of all the world. It was because of its superiority as building material and its resistance to decay that it was first selected for destruction by the early settlers. Next it became the favorite wood for household ornamentation, and for furniture; with result that it was more sought after than any other American wood. And finally came the World War, when every gunmaker in the world set out to get walnut to make gunstocks out of, with the result that the walnut tree, of suitable size for timber has about disappeared."

Uncle Bill is going about asking the Scouts to gather every walnut they can find, store them up in damp sand in a box or barrel in the cellar and next spring plant them out in odd corners about the farm. The reason for not planting the seed this fall is that "Happy Jack," the gray squirrel, or "Chatter," the red squirrel, will almost surely smell them and dig them up when the ground is not frozen too hard.

He explains that the walnut requires a good deep soil supplied with abundant moisture such as found in depressions or along stream banks or bottoms. When started there the walnut makes a fairly rapid growth and

in the course of a few years begins to bear a crop of nuts almost every year. The very dark wood is fitted for many uses about the farm or is readily salable for cabinet work and ornamental purposes. While it takes years to produce the valuable hardwood in merchantable sizes



"UNCLE BILLY" AND TWO OF HIS MANY ENTHUSIASTIC FRIENDS
This is Colonel Crosby, better known as "Uncle Bill" to the boys and girls of America.

meanwhile the tree is hardy, beautiful and profitable.

"My aim," says Uncle Bill, "is to restore the black walnut to the position which it formerly occupied over much of the Eastern United States as the King of American Trees."

TIMBER CONSERVATION IN WYOMING

BY QUINCY R. CRAFT

FIFTH from newest State, and one whose population is less per square mile (conservation resulting often from the demands of dense population) than any other State, Wyoming probably leads all other States in the proportion preservatively treated of the timber used, and of the timber cut, within the State. This is largely due to the fact that so great a proportion of the timber cut and timber used is in the form of ties. Since nearly all the timberland in the State is included within the National Forests, the proportion of its timberlands under forest management is perhaps as great as in any State. Less timber is cut in Wyoming than in any of

Of the 1,746 miles of railroad in Wyoming, 1,460 miles, or 83 per cent, are operated by the three systems that have treating plants within the State. In equipment and management, these plants are among the best, and have a combined capacity of over 7,000 ties per day, or upwards of 2,000,000 a year. Incidentally, their geographical distribution, at north central, west central, and southeast points, is admirable for handling the tie products and meeting the timber preserving requirements of the State. Scarcity of tie cutters during the war period reduced the supply of ties below capacity, but running full time these plants should be able in three



JAM OF THIRTY THOUSAND TIES BEING DRIVEN DOWN BLACK'S FORK, WYOMING

Ties constitute in larger measure the treated timber products of Wyoming than of any other state. The Wyoming ties are mostly lodgepole pine and generally hewed and many thousands of the ties intended for the Nebraska companies are treated at Wyoming plants.

the Western States except South Dakota, Utah and Nevada, yet more timber is treated than in any Western State except those on the Pacific Coast, and the proportion treated is greater than in these.

A pioneer in wood preservation, the Sheridan treating plant of the Burlington was installed in 1899, at a time when the Southern Pacific was the only other railroad in America that had a treating plant; and there were but seven plants owned by railroads when the Union Pacific built its Laramie plant in 1903. A score have been erected by railroads throughout the United States since 1903, including one by the Chicago and North Western at Riverton, Wyoming, in 1915.

years to treat the ties required for renewals on all Wyoming trackage in a decade, and treat ties more than two-thirds of the time for the lines in other States. As a matter of fact, many thousands of ties for the lines of these companies in Nebraska are treated at the Wyoming plants.

The Wyoming ties are nearly all lodgepole pine, and mostly hewed. Those from without the State, largely western yellow pine from the Black Hills for the Sheridan plant, Douglas fir and western larch from the northwest for the Riverton plant, and Douglas fir for the Laramie plant, are mainly sawed, with the exception of

large quantity of lodgepole hewed ties from the Uinta Mountains of northeast Utah, sent to the Laramie plant.

From the forester's point of view, Wyoming is the lodgepole pine State, since this is the most important species in seven of the eight National Forests of the State, and in four of these it comprises 80 per cent of

at present the closest study of foresters to determine how best to speed up the cutting cycle with a tree that grows so slowly.

The builders of the Wyoming treating plants are not sorry they began to practice conservation. The Union Pacific has added two more retorts to its plant at Laramie.



ONE OF THE LOADING PLANTS OF THE STANDARD TIMBER COMPANY

Here ties are delivered on cars of the Union Pacific Railroad, at Granger, Wyoming. Water transportation, by fluming or driving streams, and labor-saving equipment, are used in the largest way in Wyoming tie operations. At Riverton transverse conveyors carry the ties from the main conveyor to the individual piles.

the stand. In the other National Forest, the Teton, lodgepole will be conspicuous if not the chief species, whether sales are of tie or pulpwood material. Because of its occurrence in a region where other timber trees are less plentiful, and of its promise to restock through plentiful reproduction, this species merits and is receiving

Based on its experience at Sheridan, the Burlington built a five-retort plant at Galensburg, Illinois, in 1907. If proportionate application of this form of conservation were made throughout the country, a marked reduction in the drain on the forests would result, to the advantage both of users and of the public.

FOREST FIRE LOSSES

TWO-THIRDS of Canada's forests have been destroyed by fire in the last 75 years, according to figures of the Forestry Department of Canada. The amount of timber burned would have supplied the world for 450 years at the present rate of consumption and represents a loss of a billion dollars.

Canada still has 1,900,000 square miles of forests, the forests of British Columbia constituting one of the two greatest tracts of commercial timber in the world, the other being in Russia.

Forest fires in this country are designated by Colonel W. B. Greeley, Forester, as "the chief cause of forest devastation" and he urges most emphatically the immediate need of a nation-wide drive against the forest fire.

Not only have great forest fires visited this country

since the landing of Columbus but large tracts were swept clean of timber before a white man ever used an ax here. An eminent scientist and historian, according to the *American Lumberman*, states that if the discovery of America had been postponed five centuries, the discoverers would have landed on a treeless continent. Indians and lightning set these fires. The Indians were burning the woods to make pasture for deer and buffalo.

IN Japan, all the wooded land is carefully guarded, practically every tree on the Government forest land is listed and not one is allowed to be cut down except with express permission of the Government, and then not unless another tree is at once planted in its place."—*Mountain Echo*.

"WE HAVE DESTROYED OUR FORESTS FAR

IMPORTANCE of putting the idle acres of the country to work growing trees continues to be one of the foremost topics for editorials by the newspapers and more and more the co-operation of the editors with the American Forestry Association is becoming felt throughout the country. The need of a national forest policy and for better fire protection has been taken up by publications for the first time in many instances now that the Association has put it before the editors as a business proposition not alone for themselves but for the country. Some of the editorial comment follows:

Kansas City Journal: It probably has not occurred to many persons that the forests of this country influence the price of shoes and the cost of roast beef for the family dinner. Yet, according to a statement by the American Forestry Association, this is the case. The situation is outlined tersely in the form of these questions:

"Do you know forest conditions of this country have a direct bearing on the price of your roast beef and the cost of your shoes?"

"Do you know that other sections than the West must make up the deficiency in Western pasturage if the supply of live stock is to keep up with the increase in population?"

"Do you know that the greatest economic problem that now confronts the United States is locked up in eight Southern States, including Texas?"

"Do you know that 10,850,000 head of cattle can be pastured on idle land in the South within easy shipping distance of the manufacturing centers of population?"

With this as the basis, a plan is presented that it is believed will unlock that problem of the Southern States. The three solutions to the problem presented are livestock ranches, reforestation and livestock farms. In the matter of ranching on a large scale, it appears that there has already been a good start in the coastal plain in Florida, but elsewhere there is little doing. It ought to be explained that the big cattle ranches of inland Texas are included in the present West where there is a deficiency in grazing pasturage. What is considered is the coastal plain along the Gulf and the Atlantic shores.

But the problem would not be really solved even if the big ranches in that region were multiplied many times. If the forests are all cut off and not replaced in part, that fate following all such failures to provide for conservation of moisture and control of the rainfall, severe drouths and

eventual relapse into something resembling a desert will follow.

So the combination of the other two plans, reforestation and livestock farming, seems to be the real solution that must be sought. Details are given of how this might be brought about, but it is made plain that the basis must be a systematic plan, and that there is urgent need of government aid and control in the matter. Briefly put, the problem is one that affects the nation as a whole, and the solution must be a matter of national co-operation.

More and more it is made clear that the fundamental problem of practically all existing national complications is that of forestry in some form; and reforestation on a nation-wide and scientific scale would go farther toward solving much of the present vexation than almost any other one thing that might be mentioned. With this plan well under way, the unraveling of the tangle would be well started.—Rochester Democrat Chronicle.

Florida Times Union: In the May number of the AMERICAN FORESTRY Magazine, Thomas P. Ivy, gives his conclusions drawn from a study of certain economic conditions and these conclusions are interesting to the South. They are in line with the words of D. F. Houston, on one of his reports when he was the head of the agricultural department, on the greater share this section would bear in the economic progress and prosperity of the country in the future.

We believe that Mr. Ivy states a truth when he says that the shortage of paper, consequent upon the smaller supply of pulpwood, and the high cost of building material proves that we have cut and destroyed our forests far below the margin of national security. The traditional belief that our national resources are inexhaustible has resulted in a reckless waste of those resources and the effects now seen are waking many out of that dream. The present prices of shoes and beef are a sign, Mr. Ivy reminds us, that other sections must make up the deficiency caused by the encroachments of agriculture upon the Western grazing lands if the supply of live stock is to keep pace with the increase in population. This is a position also supported by the figures given out from time to time by the United States Department of Agriculture. To quote Mr. Ivy:

"In casting about in search of a solution of the future supply of cattle and timber, the Southern States have attracted attention on account of the vast area of cut-over lands there that has within it possibilities of the widest and highest value to

the people of the whole United States because near the center of population. That part of the Southern States known as the Coastal Plain has conditions which are most favorable for the development of the cattle industry in conjunction with reforestation, provided there is applied to the problem a well defined national policy that will enable the owners of these lands through governmental financial aid to develop their holdings in accordance with their best possibilities."

The area of cutover lands in the coastal plain extending from Texas to North Carolina, and inclusive of those states, is about 108,500,000 acres. This is more than the combined area of Florida, Georgia and Alabama. On the lowest estimate, the writer computes, this area would pasture annually 10,850,000 head of cattle. Three-fifths of it could be made to grow timber at the rate of ten thousand board feet per acre at the end of a timber rotation of fifty years, in the meantime being available for turpentine operations.

On the basis of ten acres per head of cattle, it might be possible to profitably reforest this great area and also use it for grazing purposes, but our Southern forests do not grow grass profusely. But these cutover lands could and will, in the future, support great droves of the finest cattle the world ever saw—when the cattle tick is finally eradicated. Out of all the economic disturbances of the present the South will rise to an eminence as a provider for the world beyond the dreams of its oldest citizens. Producing cattle, cotton, sugar, oil, phosphates, naval stores and other valuable products beyond the measure of other sections, the South's wealth in the not very distant future will be enormous.

Atlanta Journal: In eight Southern states, Georgia included, there is locked up what the American Forestry Association considers the richest economic opportunity in America, an opportunity which if turned duly to account will solve some of the irksomest problems of the day. The coastal country from Texas to North Carolina contains 108,500,000 acres of cutover lands—nearly thirty per cent of the area of this entire region. Imagine the territory of Georgia, Florida and Alabama stripped of farms, orchards, cities and other improvements, and left to idleness. That is virtually the situation with this vast acreage of deforested lands. Capable in latent treasure of maintaining a population of many millions, it is now to all practical intents no better than the lost Atlantis.

National welfare no less than Southern interests, says the Forestry Association,

BELOW THE MARGIN OF NATIONAL SECURITY"

demands that these resources be unlocked and utilized. In the May number of its official magazine it points out that at the lowest estimate this area would pasture 10,850,000 head of cattle, or nearly one-sixth of the total number now in the United States. "At the same time," it adds, "three-fifths of these idle lands could be made to grow timber at the rate of 10,000 board feet per acre at the end of a timber rotation of fifty years, provided lumber be desired instead of pulpwood." As the first practical step the Association recommends a forest and soil survey in order that no time or means be wasted on efforts ill adapted to local conditions. "The second step would be for the government to broaden the Farm Loan Act so that financial assistance could be extended to the men engaged in converting a waste area into fields and forests that would produce food and shelter for one-sixth of the entire population of the United States."

These suggestions, be it observed, are not from imaginative "promoters," but from scientific students whose sole interest in the matter is the common country's well-being. Nor can anyone doubt the wisdom of their counsel if he will look into the facts of the nation's forestry problem and food-animal shortage, and then glance at the vast possibilities in the South's cut-over lands. The critically high prices of lumber, print paper and most other products derived from wood are evidence enough that unless something is done to replenish America's sorely depleted forest resources, conditions ere long will become desperate. Likewise the prices of meat, of dairy products, of leather and of goods manufactured therefrom are evidence enough that the utmost effort should be made to increase the production of these necessities. In the cutover lands of Georgia and other Southern States lie the most readily available means of meeting these needs—a fact of almost immeasurable import.

Peoria Journal: In view of the soaring lumber prices and the unprecedented shortage of print paper, figures compiled by the American Forestry Association are interesting as emphasizing the rapidity with which our forests are disappearing. The investigation reveals that the New England States are no longer self-supporting in a lumber way, but Lake States, once the greatest producers of lumber, are now importing to keep alive the many wood using industries in that section and that the center of the lumber industry is rapidly moving to the Pacific coast. This, of course, means long hauls and high freight rates. The supply of yellow pine in the

south will be exhausted, at the present rate of consumption, in about fifteen years.

A feature of the war was Germany's destruction of French national forests which had stood for hundreds of years and in which no cutting had been allowed except by official permit. The needless loss roused the anger of Americans in France, and yet the area burned out in this country annually by forest fires far exceeds the destruction wrought overseas. The annual

FINE CO-OPERATION

An example of fine co-operation with the American Forestry Association is the following by P. J. V. M'Kian, in the Insurance News Department of the Chicago Herald Examiner:

The National Fire Protection Association is circulating a leaflet issued by the American Forestry Association on "Facts about Our Disappearing Forests," in which it is pointed out that fire destroys over \$20,000,000 worth of timber every year and kills the reproduction upon thousands of acres of forest lands.

Attention is called to the fact that a single fire among young trees may not always kill them, but that it will check their growth and weaken them so far that they will be very susceptible to insect attacks and fungus diseases.

Plans have been worked out which aim to prevent forest fires from gaining headway, which is accomplished by means of patrols stationed along carefully laid out routes. During the last two years airplanes have supplemented the watchfulness of men on horseback, and this system has been extended to all the large areas of wooded land in the Pacific Coast States. Telephone and tool stations have also been established and operated in connection with lookout stations and broad fire lines, on which the accumulated debris has been burned.

timber loss in the United States is approximately \$28,000,000, and yet the nation manifests only passing interest in the efforts of the Federal and State Governments to prevent this appalling waste.

It is high time that all land owners should give heed to the rapid disappearance of forest trees and should do their part in however small a way to offset the scarcity of timber. There are few farms without some corner, ravine or untillable ground where crops cannot be raised that is suitable for trees. It is true that no early return would be realized on the investment of time and labor, but a concerted movement would do much to replace the timber that once covered such a large portion of our land. Even if science finds a substi-

tute for wood pulp in the manufacture of paper, more trees will be needed to conserve some of the rainfall now drained off too rapidly.—Muncie (Ind.) Star.

Worcester Post: Charles Lathrop Pack, president of the American Forestry Association, calls our forests the backbone of all industry and cites some figures to prove it. Take a look at these facts and then indorse the Association's move to have Forest Preservation week multiplied by 52.

Ten years ago the United States produced its entire supply of pulp wood, but now two-thirds of it is imported. This means freight rates to be added to the purchase price.

Indications are that supplies of pulp wood timber in New England and New York will be exhausted in 10 to 20 years.

Ten years ago the United States produced its entire news print supply—now we import two-thirds of it.

Do you wonder that newspapers are fighting for their lives? Do you wonder what makes the cost of building a home so high?

Experts predict saw-log lumber will be gone in 50 years.

The bulk of the original supplies of yellow pine in the south will be gone in 10 years, and within seven years 3000 manufacturing plants there will go out of existence.

White pine in the Lake States is nearing exhaustion, and these States are paying \$6,000,000 a year in freight bills to import timber.

New England, self-supporting in lumber 20 years ago, now has to import one-third of the amount used.

Fire destroys over \$20,000,000 worth of timber every year and kills the reproduction upon thousands of acres of forest lands.

Trenton Advertiser: Depletion of the forests of the United States within 65 to 75 years with a resultant slump in all enterprise that depends wholly, or in part, on timber products can be averted if action is taken without further delay. This is the declaration of an authority on the subject—the American Forestry Association of Washington, D. C. Unless immediate forestry steps are taken—and taken in considerable magnitude—a serious situation will confront future generations. In fact, many boys and girls of today and some mature persons as well will live to see a time of embarrassment and distress unless radical moves are made to replace the trees that are now going so rapidly into the maw of manufacturing, the appetite of which grows with consumption and becomes all the more menacing as the supply decreases.

THE POETRY AND PROSE OF FRENCH FORESTS

BY WILLIAM H. SCHEIFLEY

THE French, in their appreciation of forests, seem to have inherited something akin to the Greek and Roman adoration of sylvan deities and the Druidic worship of trees. Such a feeling is early attested in the *Song of Roland*, the *Romances* of Chretien de Troyes, and the *Lays* of Marie de France; but it may be discerned in every epoch. Ronsard, writing in eulogy of the forest of Gastine, exclaims:

"Hearken, woodman; withhold the threatening stroke!
These are not trees you ruthlessly lay low.
For, see you not the blood distilled in pain
By nymphs who dwell beneath the hardy bark?"

Even during the seventeenth and eighteenth centuries, when attention was so largely focused upon the world of fashion as to obscure the previous sylvan enthusiasm of Rabelais, Charles Estienne, Ronsard, Bernard Palissy, Olivier de Serres and Sully, men like La Fontaine and Buffon could not forget amid court frivolities their joy in the woodland. A certain Jesuit of the period, Jacques Vaniere (1664-1739), celebrating in his remarkable *Prædum Rusticum* the beauties of the forest, affirms:

"To the orchards, to the forests, your first cares are due.
Plant, plant, to begin with, if later you'd build."

Rousseau and the economists express an interest in forests both sentimental and practical, and Gregoire, a member of the National Convention, after depicting in his *Essai des Arbres de la Liberte* the devotion to trees in antiquity, gives an interesting account of the ceremonies connected with the planting of "Liberty Trees" during the Revolutionary period, 1789-1800—a custom revived in 1830 and 1848. The National Convention, believing the tree to be "the object which the French cherished most," decreed that it be planted in every commune and confided to the care of the citizens.

During the nineteenth century, in particular, the cult of the forest has flourished, trees having been extolled in poetry and prose for their beauty and age, as companions to man and silent witnesses of his achievements. "With the last tree," declares Michelet, "will disappear the last man." In the same vein, Chateaubriand affirms that "Wherever trees have disappeared, man has been punished for his lack of providence." Adolphe Rette exclaims:

"Sing praises to the trees that are so beautiful
And that rustle so softly in orchards and forests!"

Marcel Prevost holds that only the sea and the mountains can rival the forest in beauty. Paul Margueritte finds that "There is no season when we are not dazzled by the splendor of the forest." Taine, according to Maurice Barres, regarded his favorite planetree as a master in ethics. "How I love that tree!" he cries. "I never grow tired of admiring and interpreting it. During the months I spend in Paris, it is the goal of my walks. Every day, in all kinds of weather, I pay it a

visit. It will be the friend and counselor of my declining years." Not less enthusiastic are the words of Francois Fabie:

"O chestnut trees, brave offspring of the Cevennes!
Within whose veins courses good Gallic blood!
You I revere as I would hold in awe the aged;
Rejoicing that in the sun, instead of pallid marble monuments,
You, noble trees, sturdy and strong, rise to heaven
As witnesses of the ancients among their descendants."

Still others have shown their enthusiasm for trees. Georges Lecomte vaunts in poetic prose the "surges of mysterious verdure, in which the Spirit of Darkness seeks concealment during the splendor of the day, only to envelop the earth again upon emerging: Edouard Schure greets his favorite fir trees with the words:

"Hail, invincible kings of heights untrodden!
Behold, youth encompasses you in torrents,
And you delight to thrill to balmy breezes
When Spring ferments beneath your green branches."

Lamartine pays homage to the autumnal woods:

"Hail, woods, crowned with a last vestige of verdure,
Your yellowing leaves on the meadows strewn!
Hail, last sweet days; the mourning of nature
Matches my grief yet charms my sight."

Lamartine could never forget the "majestic sycamores" that had afforded him shelter in the Holy Land. Henri de Regnier, who likens the sylvan splendor of autumn to a pyrotechnic display, avers that: "At Versailles, Autumn is sovereign. His scepter creates there a fairy land. In order to receive him, the trees adorn themselves in the richest and most sumptuous of colors, donning gold and purple, decking out the alleys and basins and filling the solitude with the splendor of their attire." Maurice Maeterlinck thinks that, "whether viewed by sunlight or moonlight, in the burning heat of summer or the white garb of winter, nothing is comparable to the architectural, altar-like alignment of innumerable trees, lifting heavenwards, smooth, rigid, clear-cut, crowded close like a bundle of lictors' rods." Sincere is the tribute of Gerard d'Houville to his adored maritime pines: "Lofty pines by the sea, extending toward heaven your wide-spreading, swaying summits, you abide in my memory, and embody the fondest dreams of my childhood." Charles Le Goffic sees in the twilight haze of Brittany towering, tapering poplars that resemble a ruined cathedral reduced to bare pillars.

In all this admiration of the forests may be discerned a tendency to personify trees as organisms endowed with animal or human traits. Emile Verhaeren sings of a woodland friend:

"That willow tree, I love it like a human friend.
Morning and evening and by night,
At every hour, indeed, I seek it eagerly."

Charles Doumier likens trees to "faithful guardians of the threshold," or "shepherds clothed in a green mantle." Gerard d'Houville confesses that when young he used to throw his arms about certain trees and press his cheeks against the bark, imagining that he could hear the beating of their hearts. Chateaubriand exclaims:

"Forests, stir gently in the breezes;
To whose eyes can you ever be so dear!"

Leon Dierx also seeks their company:

"It is to hear your music that I have fled the world,
O woods melodious, singing in the wind.
Never do I hearken to your sighs profound
But what my glowing heart is touched with holy awe."

Jean Richepin affirms that "trees are living personages." Camille Lemonnier, addressing an ancient oak, exclaims: "Ancestral tree, august Father, accept our veneration! For a thousand years you have greeted Phoebus as his chariot appeared in the east. You are a brother of the rivers, the mountains, and the plains." Brizeux, who desired to be buried beneath an oak, associates such trees with the Druids of old and the modern Bretons:

"Dream of the ancient gods, dream of the ancient priests,
Under the sacred oaks lie couched our great forefathers;
Open the hardy bark and you shall see again
A lovely Druid fair with golden sickle.

An oak a century old with splendid foliage,
A Breton hoary-haired in ripe old age—
These are twins, knotted, gnarled and hardy,
Two brothers both in pith and vigor rich."

Michelet, for whom trees are "monarchs of sorrow," declares that "in days of trouble we should seek consolation from the oaks, since they inspire fortitude." In certain regions of Northern France, says Paul Sebillot, trees standing near a house in which a death has occurred are regarded as having suffered a personal loss, and are draped in black. One of the most touching situations depicted by Henry Bordeaux is the scene in which M. Roquevillard, in grief, seeks consolation among the trees of his ancestors, leaning against an oak as "a brother of sorrows." And behold, the silent sylvan creatures, "a moment before so many anonymous units stood forth like personages"! Similarly, Francois de Curel, who regards the trees of his forest as loving confidants, likens to supermen those that tower above the others majestically. Analogous is the conception of Barbey d'Aurevilly, who speaks of such trees as "that final aristocracy destined like the human nobility to suffer destruction, and for the same reason." Anatole Le Braz, in lyric strains, interprets as if at the request of the oaks of Brittany their sentiments and aspirations. "Our hearts are sound," they say; "our faces uplifted, our foreheads proud."

Many French writers have been impressed by arboreal language and music. Verlaine declares with fervor:

"The white moon
Shines in the woods,
And from every branch
There sounds a voice."

Paul Fort delights to hear "that divine chanting in the branches of the oaks sounding in sonorous cadence their nuptials with the stars." Guillaume Apollinaire avers that

"The pines, sweet musicians,
Sing of ancient Yule-tides
To the autumnal evening winds,
Or, grown more grave, they chant
Incantations to the thundering heavens."

The music of the forest is vaunted by Charles Fremine in glowing epithets like "orchestre vegetal," "un chant large et pacifique," "la verte symphonie," and "les chenes sonores qui font passer comme un frisson d'Armures." Well known are the words of Alfred de Vigny:

"Observe that ancient trunk with roots immense;
Once it could speak in words divine."

Such has been the romantic apotheosis of the forests, especially during the past century. But are the poets alone in their appreciation? By no means! The utility of the forests has been demonstrated in peace and in war. In peace the pestilential marshlands of Gascony and Sologne have been converted at small cost into healthful prosperity; and in the Pyrenees and the Alps forestation has been observed to check erosion, to calm torrents, to prevent inundations, and to maintain the flow of springs. What the French did not fully understand was the strategic and industrial role of forests in war—a fact now brilliantly established. Competent judges hold that France was saved by her forests; since these, besides affording to her armies a defensive screen during the crucial days of the first invasion, enabled them to concentrate unobserved and to hurl the enemy back at the Marne, both in 1914 and in 1918. When the submarine checked importations of wood for military and industrial purposes, had it not been for the extensive timber reserves of France—the husbandings of half a century—the Allied armies might have been fatally handicapped. Little wonder that the eminent critic J. Demorlaine should declare that the forests of France played in the war a part as important as her canon.

But at what appalling cost was disaster averted! Her sylvan legions are mutilated or destroyed. It will take decades to make good her loss of twenty-five billion board feet. For the next forty years at least France must draw largely upon the forest domains of her colonies, and, as Henry S. Graves, our chief forester, has pointed out, her wood industries, affording employment to seven hundred thousand, must long suffer. Never, therefore, have silviculture and reforestation been so necessary. Now is the time for lovers of trees to do their bit. Certainly, the fine spirit we have noted among writers of poetry and prose augurs well for the work. The admirable custom of planting trees along the highways, dating chiefly from the time of Henri Quatre and Sully, should be revived and extended.

Edmond Pilon, writing in *L'Opinion* for January 14, 1920, says that the recently founded *OEuvre des Chenes Celebres* (Society for the Culture of Celebrated Oaks) purposes, as one of its works, to plant trees in memory

of famous Frenchmen. The Society will begin in the gardens of the Invalides (or Military Museum), dedicating its first oak to General Gallieni, the military governor of Paris, who played a prominent part in the battle of the Marne. Among other well-known patriots destined to receive shortly arboreal monuments are Charles Peguy, Ernest Psichari and Guynemer. To be sure, the forest of Fontainebleau contains trees named for such popular heroes as Roland, Bayard, Turenne, Conde and Hoche, but these were not planted as commemorative monuments. The new custom, therefore, will assume a more personal form of national gratitude.

Octave Mans suggests that the *Ligue des Arbres* should organize pilgrimages to historic trees, just as now archaeological societies make trips to cathedrals. He would prepare, with the co-operation of the Touring Club, a classification of celebrated trees, to be posted in the schools. Thousands have admired, in the Paris Botanical Garden, the Lebanon cedar which, in 1735, Jussieu is said to have "brought back in his hat" from the Holy Land. In view of the lessons of the war, the French will heed the warning of Colbert, who expressed the fear that France might some day perish for want of

wood. More than ever will they revere the names, too long forgotten, of Bernard Palissy and Olivier de Serres. They must take to heart the exhortations of Andre Theuriet:

"In the deepest of woods the nation keeps its heart;
A people without forests is a people that dies.
Hence whenever a tree succumbs,
Let us vow one and all to plant a successor upon its tomb,
And let us vow to reforest the denuded wastes
Where quick-rising floods swell into torrents
And the mountain sides are bitten bare by grazing sheep
And the rocks thrust forth like Nature's bones.
And may our children behold in future seasons
The robust branches of oaks and pines
Sway o'er the plain and flaunt their feecy foliage in the air
Like the fruitful tossing waves of the sea."

In addition to her depleted timber areas, France possesses fifteen million acres of waste lands awaiting afforestation. Aid from America in the form of nursery trees and seeds has already been gratefully accepted. The American Legion might well offer to participate in converting at least part of the battle-front into a "sacred forest."

MEMORIAL FORESTS—WHY NOT?

MEMORIAL trees have been planted by the hundreds in honor of the boys who fought in the Great War, and hundreds will be planted yet in their honor. But why stop with the planting of one tree in honor of each? Why not make it a half acre, or even more, for each, and bunch the planting to make a forest? We can call it whatever we may, a township, a municipal, a county or a community forest, letting it be distinctly understood that it is to serve as a memorial forever to those for whom planted.

All the arguments in favor of memorial trees apply in greater measure to the memorial forest. But the tree will be gone, in the course of two or three hundred years, at the most; the forest, rightly handled, will remain practically forever, even though individual trees come and go. Suppose we call to mind the city forest of Zurich, Switzerland, under continuous management since the Eleventh Century. Similarly, too, ours should not be a forest preserve with no harvesting of the products, but an area whose resources would contribute to the well-being of the people. I believe those in whose memory it exists would rather have it so.

Many persons who know tell us that France's trees played a powerful part in winning the war. Notice, however, that they pay tribute not to France's trees, as trees growing singly, but to the collection of trees, the forest.

This country needs more tree planting to make it a better place in which to live; trees can serve as memorials and serve the second end, too. But the country needs to have forests planted: let us not overlook the possibilities of the memorial forest.

REFORESTING WAR SWEEPED REGIONS

THE following letter, acknowledging the receipt of seeds donated by the American Forestry Association to France, has been received by the Association from Ambassador Jusserand:

"I beg to say that my Government has taken all the necessary precaution for the receiving and proper utilization of the seeds so generously offered to us by your Association.

"Our Minister of Agriculture has given to the 'Conservator of Waters and Forests' at Rouen the necessary instructions for all the seeds to be sent, the moment they reach Havre, to the central warehouse of the Forest School we have at Nogent sur Verriession (Loiret), which will see to it that each lot reaches at the proper moment its definite destination.

"In the letter I have just received the Minister adds that most of the seeds of the Douglas Fir will be sent to the Departments of Aisne, Oise, Ardennes and Somme for the reforesting of the regions devastated by the war. The seeds of the leafy trees, such as oak, ash, poplar, will be sown this spring in the nurseries of the same school and of that at Nancy. The seedlings will be watched with care and it will be only when they are three or four years old that they will be planted in the regions appropriate for their growth. The results reached will be made known to this Embassy from time to time, and I shall keep you informed thereon.

"The Minister adds an expression of his desire that his feelings of deep gratitude and those of our Administration of Waters and Forests be conveyed to the American Forestry Association."

THE AMERICAN ANTELOPE

BY R. W. SHUFELDT

WE have no true antelopes in this country, as all the animals of that group—including the gazelles—are Old World species and especially of African habitat, where many interesting kinds are found. In the United States we find but one animal that in any way approaches the veritable antelopes in anatomy, form, and habits, and this is the well-known Pronghorn antelope, or, as it is almost universally known with us, simply the antelope. It has other names, however, for it has been called the Prongbuck, and, by the earlier settlers of the West, the Cabrit and Cabree. It is the sole representative of both the genus and the family, and it is safe to say that it is the only animal of its kind in existence. We have no fossil remains of any form closely related to it.

Of course, our antelope are now very rapidly disappearing, while formerly they were very numerous. Their present distribution, however, is generally given as occurring from the Mexican boundary, northward to the valley of the Saskatchewan (Lat. 53°), and on the plains from the Missouri River westward to the Rocky Mountains. In Washington and Oregon the Cascade Range formerly defined their extension in that direction; but in the absence of exact statistics on this question, I am not prepared to state over what areas of their former range—before they were molested by man—they may still be found.

Antelope, wherever met with, is purely an animal of the plains and open, rolling country, never being found in the timber, much less in the mountains. We have no history of its ever having been found east of the Mississippi River, and we possess no evidence of this kind through the discovery of fossil or subfossil remains in this region, nor in Indian mound-relics and tradition.

A full-grown buck antelope is smaller than any adult specimen of our American deer, and quite different from any of them in form. It has a big head, which is held erect upon a short, thickset neck. The body is robust

and somewhat chunky. It has a very short tail, and rather short, slim limbs. Its small pointed hoofs are bifid and black, and its horns are peculiar, being situated on bony cores supported by the frontal bones, deciduous and hollow to the extent of admitting into them the aforesaid cores. These horns are perfectly black with whitish tips, and at the middle of each there springs a short, triangular snag in front. Below this, the horn is laterally compressed while it is cylindrical above it. Cutaneous glands and hair tufts are absent

from the limbs, while they do occur singly over the flanks below, at the base of each ear, behind each hock, and a dorsal one; and each foot has an interdigital one—eleven in all. Beneath the eye, both the lacrymal gland and sinus are absent. Aside from numerous anatomical characters, it may be stated that in the mouth-parts the mucuous membrane and naked areas are coal black; the hair on the cheeks and top of head above the eyes, as well as the under side of the head, is white; face very dark brown—a color which also surrounds the white ears, and there is a patch of the same under each ear. Upper parts are yellowish brown, below, white. There is also a white spot behind either ear; the throat is white, and the two triangles on the front of the neck are likewise white. Rump white; legs ocre brown, and the tail white, with a



A FULL-GROWN MALE AMERICAN ANTELOPE

Figure 1. Drawn by the well-known British animal artist, J. Smit, for the Zoological Society of London. The long tail removed by the present writer, and the figure retouched. Only in the adult female does the horn grow to a length so as to be visible above the hair.

dash of tawny on the upper side. All rudimentary hoofs are absent, and the eyes are black, large, and very expressive. The hair on the back of the neck is produced as a short mane. The length of the animal is four and a half feet, with height at the shoulder nearly five feet in full-grown males.

Judge Caton describes the topographical character of the antelope in great detail—perhaps some would say in greater detail than is necessary for so well known and so easily recognized an animal; but in this opinion I do not concur. It is very evident that the Judge was writing for all time and not simply to satisfy the popular taste of his day. For example, he says of the eye

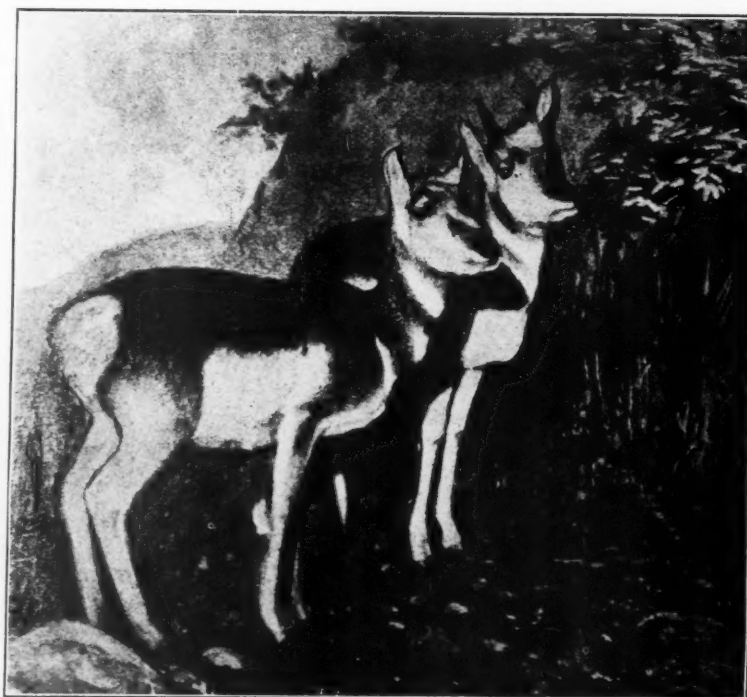
that "it is larger than that of any other quadruped of its size. By a careful comparison of the living eye with the taxidermists' scale, to enable me to order eyes of the proper size for mounting specimens, I found it necessary to select the next to the largest. Indeed, the eye is very nearly the size of that of the elephant, and much larger than that of the horse or the ox." After recording much more about this organ, he says of the ear that "it always stands erect when the animal is standing at ease. When it becomes excited, the ears are projected forward to catch the least sound, which imparts a look of animation to the animal. The ear is five inches long, three inches broad at the widest part, terminates in a pretty sharp point, and is covered with hair inside and out."

The matter of the growth, development, and shedding of the horns of the American antelope has always been a question of decided interest. For a long time it was stoutly disputed that the animal shed its horns, and the subject constantly found its way into the sporting journals and magazines of popular natural history. I had the honor of being in at one of these, and the question arose by attention being called to it in a sporting magazine of the time, contributed by a retired officer of the Army. In a somewhat elaborate article, this writer strongly denied that the antelope ever shed its horns, and the editor of the aforesaid magazine invited me to take the matter up for him. My opinion was that his correspondent was wrong, as the shedding of the horns of this animal has now been known to science for many years, and has been carefully studied and described by a great many competent naturalists. Caton studied the entire process in his private deer parks years ago; it has been observed in the Zoological Society's Garden at London, and I have published a full account of it, giving illustrations showing the growth of the new horn.

Not satisfied with my answer, however, and turning to his copy of Audubon, as many a writer before him has done, to ascertain what he had to say on this point, he found that the "great bird man" agreed with him; so

he published a rejoinder in the same magazine, which I met by the following: "Some people may be curious to know why I entitle this communication 'Sledge-hammer Science.' My excuse for doing so is that it came into my head when I read what the captain had to say about Audubon's method of 'proving' that the antelope does not shed its horns. It will be remembered that Audubon knocked off the horns of a buck antelope—not in the shedding season—to prove that *Antilocapra* did not shed those appendages, and this to a lot of hunters at old Fort Union many, many years ago! Now, although Audubon was a very distinguished pictorial ornithological artist, he was by no means a well-informed scientist, neither in ornithology nor mammalogy. There was altogether too much sledge-hammer science in his day, and

there are those who are only too ready to use it in these days. Audubon might just as well have taken his hammer and knocked off the antlers of a bull elk in the wrong season, to prove that those enormous horns are not reproduced annually. Quoting a malobservation of Audubon's carries no weight with it at all, and in reference to the Fort Union episode, Caton says: 'The hunters were right and the scientist wrong; but we see how near Mr. Audubon came to discovering the truth. Had he been a little more patient in



A PAIR OF YOUNG ANTELOPES

Figure 2. This is reproduced from a published photograph in *Animal Life* made by Mr. W. Rau, of Philadelphia. The male is the one with the horns. They are difficult to rear in captivity.

his investigations, and a little less wedded to preconceived opinions, he would have had the honor of this important discovery.'

"I wonder if your correspondent has ever opened a copy of Judge Caton's 'Antelope and Deer of America,' from which I have just quoted. If not, I would advise him to do so, and read the Judge's method of showing how *Antilocapra* sheds its horns. It is not the Audubonian method, but the true, scientific one; not the sledge-hammer method, but the one employed by the patient investigator. The entire process of this unique phenomenon exhibited on the part of our antelope was also carefully studied in the Zoological Gardens of London, in the case of a fine, healthy buck. Mr. W. A. Forbes, F. Z. S., gave an account of it, with beautiful

figures, in the Proceedings of that Society for 1880, and it fully sustains what Caton and many others have observed."

Although I have seen hundreds of antelope on the Western Plains, I am free to confess that I have never shot a buck in which the spikes on the head were in the condition represented by Forbes; moreover, I found but very few of the *shed* horns, yet I *did* find them—and good specimens; some animal or other undoubtedly makes away with them. The plainsmen used to say that porcupines were very fond of them.

Exceedingly curious in character is the coat of our antelope, each hair being hollow, pointed, and fragile; that is, when once bent it nearly breaks, and, owing to its non-elasticity, will not resume its straightness. A close coat of fine, white fur is found next the skin in this animal, and Caton noticed that "whenever it is excited in play, fright, or rage, the hair on the white patch on the rump rises up and assumes a more or less radial position from a central point on each side of the vertebræ, as we sometimes see two radial points on the human head." I would add that the antelope also erects the hair this way when in great pain, which I have observed in animals of this species that I have wounded and approached to kill. This erect and bristling bouquet of snow-white hair is truly a beautiful sight, and once seen it is not likely to be forgotten.

The antelope puts these white patches to another and a very different use. By raising them and *flashing* them, they are used as signals, and are so recognized by others within sight. Such a signal is given in times of danger, as when a man or any other enemy approaches, and this fact I have noticed many times on the plains;

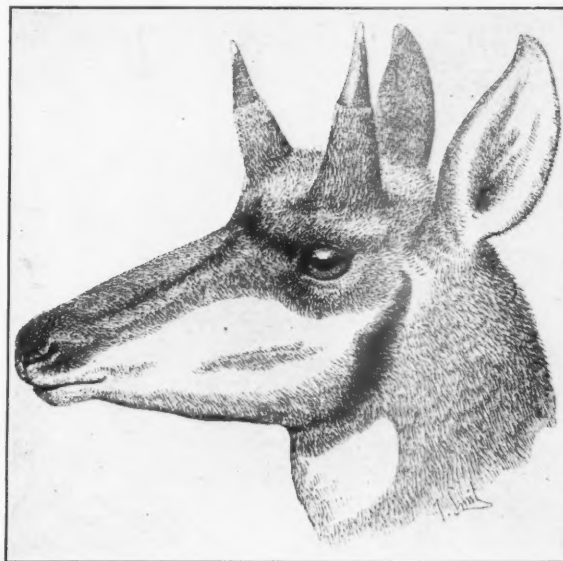
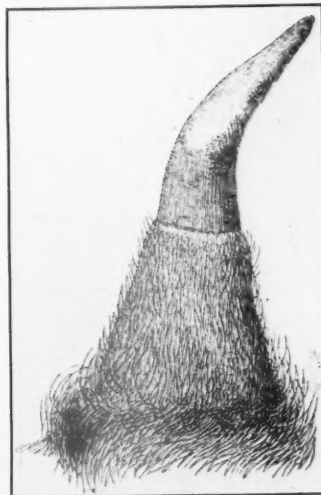
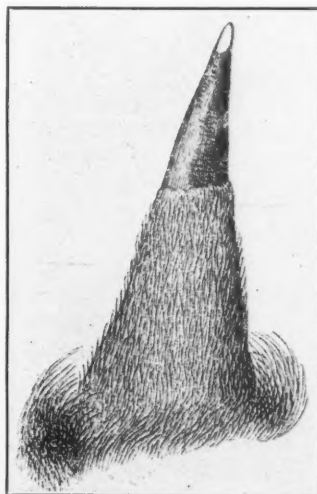
but so far as I am aware, it was first described in print by Thompson Seton, who had likewise observed it. The animals will also resort to it in parks where they are kept in a state of semi-domestication. In the case of a "bunch" on the prairie, the animal that discovers the

approaching danger will stand still, turning his or her rump in such a way that all the other antelopes in sight can see it, be it but a doe or a single buck; by alternately raising and depressing the two areas of glistening white hair, the peril which threatens is indicated. Those apprised of the danger will repeat the signal, and sooner or later all of them will take advantage of it and seek a place of

safety. It is remarkable how far such a signal can be seen—often very much farther than we can see the antelope itself, as the general color of the animal harmonizes so well with the surroundings. There is an excellent photograph of an antelope "flashing" in Stone and Cram's "American Animals," taken of a live animal on the plains. Female antelopes also develop a short pair of horns, ranging from one to two inches long; and we

may detect the rudimentary horns of the male at birth, but not those of the female. As a rule, a female bears a pair of kids at a birth, but she may have only one; all of those I have seen leading young have had two. Doctor Rothrock, many years ago, found in the uterus of a slain female twins that were largely united, as is sometimes the case with animals and plants; but he saved only the skulls, and these were joined together just back of the orbits.

On one occasion, I was hunting antelope some five or six miles north of Fort Fetterman, in Wyoming. It was early in October, and my success during the day had been wretched, for I had been tantalized several times by the sight of many antelope but had



INTERESTING PHASES IN THE FORMATION OF THE HORNS

Figure 3. These are photographic copies by the writer from drawings by J. Smit, illustrating a paper by the late William Alexander Forbes, published in 1880. The upper left hand cut is a horn the day after the shedding of the old one, and the cut on the right is the same horn one month later. The head of the animal, which is drawn a little too elongate, shows the left side view of a male antelope one day after the shedding of the old horns.



THE HEAD OF AN OLD MALE AMERICAN ANTELOPE

Figure 4. This is the right side view, reduced, reproduced by photography from a brush sketch by the author. In this specimen the horns are not as high as they sometimes grow to be. (Compare with Figures 5 and 6.)

shot never a one. Being mounted on an excellent hunting horse, I came to the top of a low, rolling hill. Upon looking down into the shallow valley beyond, there lay nine antelope on the ground—all within two hundred yards. At the sight of me they all jumped up together, and the reader may imagine my surprise when I saw that the largest buck, a full-grown and splendid specimen, had jet black head and shoulders, while the coloration of the hair of the rest of his body was normal. My brain reeled with excitement, for I would risk almost anything to obtain such a prize. Now, they were rested, while I and the horse were nearly tired out with the day's ride; so I hardly knew what to do, especially as they began to walk off at a rapid pace. Having often succeeded in a charge under such circumstances, I resolved to try it, and the spurt I made surprised the antelope, diminishing the distance between us in a trice by a hundred yards. Here I rapidly dismounted and let my horse go. Meanwhile my game had taken start, and actually flew up the side of a low, long, and narrow hill, some hundred and fifty yards beyond, where, instead of passing over its crest, they tore along at a steam-engine rate down the middle path of its summit. The black-headed buck was in the lead, the other eight following in single file. I had a heavy rifle, calibre .45, and with it I drew a fine sight on the object of my desire, who was going at such a pace that one could not keep his legs individualized.

Then, holding fully three yards ahead of him, I pulled. Imagine my disappointment when I saw a noble doe immediately in his rear plunge to one side and roll down, stone dead! Dismounted as I was and completely leg-weary, my last chance was gone; and from that day to this I have never seen or heard of such a specimen; indeed, a case of apparent melanism in an antelope—where the condition was confined to the head and shoulders—must certainly be one of the rarest occurrences in nature.

Once I was out with Lieutenant Merriam, of the Fourth Infantry; he was on foot and armed with a carbine. Upon ascending the slope of a low hill, over which, however, he could not see, some one beyond had started a bunch of fifty or sixty antelope. They rushed along the top of the hill immediately in his direction, reaching him just as they came to its summit. The surprise was profound—and mutual. The antelope, closely crowded together, whirled to one side, and he was not ten feet from them when he fired at the one directly in front of him. The ball not only killed it



DIRECT FRONT VIEW OF THE SKULL OF AN OLD MALE AMERICAN ANTELOPE

Figure 5. From a stuffed specimen prepared by the Arapahoe Indians collected by the Bureau of Ethnology and kindly loaned the writer by the United States National Museum. Note the asymmetry of horns and projecting orbital cavities.

outright, but passed through the bodies of two others, and these fell dead within a few feet of the first one. There they all lay—a buck and two does!

I had another experience with antelope when I was stationed at Fort Laramie, Wyoming, as post surgeon. Some ten or eleven miles from the fort we come to Laramie Peak—an isolated mountain known throughout the country. Beyond lay the Laramie Plains, noted in those days for the number of antelope found there, and for the fact that so few, either Indians or white men, ever visited the locality. It was in the autumn; we had not tasted venison for quite a while, and only a few of the officers cared to hunt very much. Lieutenant Rufus Brown, of the Fourth Infantry, and I did, however, and

having picketed and looked out for the animals and put out the fires, we made up the bunks on the ground. After the fashion of an old soldier, the sergeant rolled himself up in his blanket about twenty feet from where Brown and I turned in together. We had a roll of gray army blankets, with a rubber one next the ground; and we needed both, for it fell below freezing-point before morning. Sleep? Oh no, we did not sleep! Like two rocks—that's all. It was a superb, starlit night, but no moon, and where we lay it was dark as pitch. I do not think I moved at all from the time we turned in until toward morning, and I am very sure the lieutenant did not. I awoke as daylight slowly crept upon us, and was instantly wide awake with all my faculties on the alert. Brown was flat on his back, snoring like a good fellow; and I expect his joints were quite as stiff as my own from the cold and the ride the day before. I felt for my carbine and revolver; they were close alongside where I had placed them when we turned in. Cautiously rais-



A DIRECT SIDE VIEW OF THE SAME SKULL

Figure 6. Both cuts, as well as Figure 7, reproduced from photographs by the author. Note the marked circularity of the orbit, and the remarkably long coronoid process of the lower jaw.

one fine afternoon we arranged to go over to the Laramie Plains early the next morning, to see if we could not bag a few antelope, and, perhaps, a black-tail or two. Sergeant Conrad was ordered to accompany us—an excellent man and a fine shot. The poor fellow was shot some time afterward by road agents, when he was in charge of the squad with the paymaster's outfit—a most dastardly murder, several other men being ambushed with him on the same occasion.

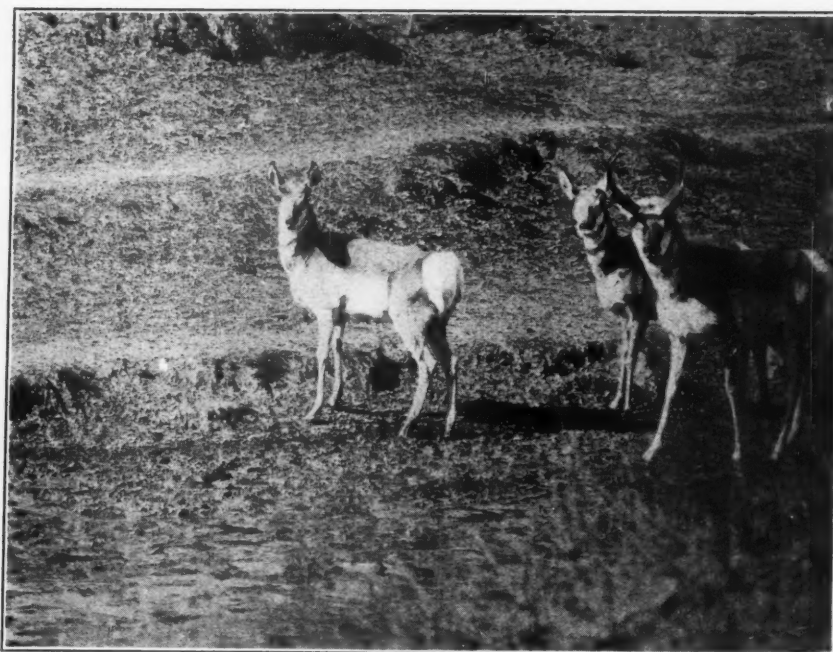
We three left at peep of day next morning, well mounted, well equipped, and with a fine lead mule. The early part of the afternoon found us on the other side of the mountain where the broad Laramie Plains begin, with weather and everything in our favor. We did little for the rest of the day beyond exploring in the immediate neighborhood of our camp. Plenty of antelope could be seen over the plains—single ones and bunches of them. We had determined not to do any serious hunting until next day, when we would make an early start, with fresh horses and all hands thoroughly rested. Although we had left hot weather behind us at the fort, it was a different story where we now found ourselves; and before sundown there was a very rapid decline in the temperature. So, after supper and about sundown,



ANOTHER SKULL OF A MALE ANTELOPE

Figure 7. This shows the horn-cores, as they appear when their sheaths are removed. Loaned the writer by the United States National Museum, and photographed by him. Collected at Fort Griffin, Texas, by Dr. H. McEldery. A bullet-hole is seen in the forehead between and just in front of the horn-cores; the latter are sharp in front and rounded behind.

ing myself on my elbow, I saw that Brown's guns were where they belonged, too; and the sergeant looked in the dim light like an old walrus, rolled up in his blankets and sleeping on his side. Pretty soon my eyes became accustomed to the early morning light, and I could, without much difficulty, distinguish objects that were not too far off. I sat up and gave my eyes, face, and stiffened limbs a good rub, and this put the blood into circulation again. Brown never moved but kept on snoring. I was about to try for another snooze, and had come down on my elbow before lying down, when I thought I saw three whitish objects out on the prairie, which certainly appeared to be moving. Antelope, I



A BUCK AND TWO FEMALE AMERICAN ANTELOPES

Figure 8. This is as they appear on the open prairie. Photographed from life and presented to the author by the late Mr. A. C. Gould.

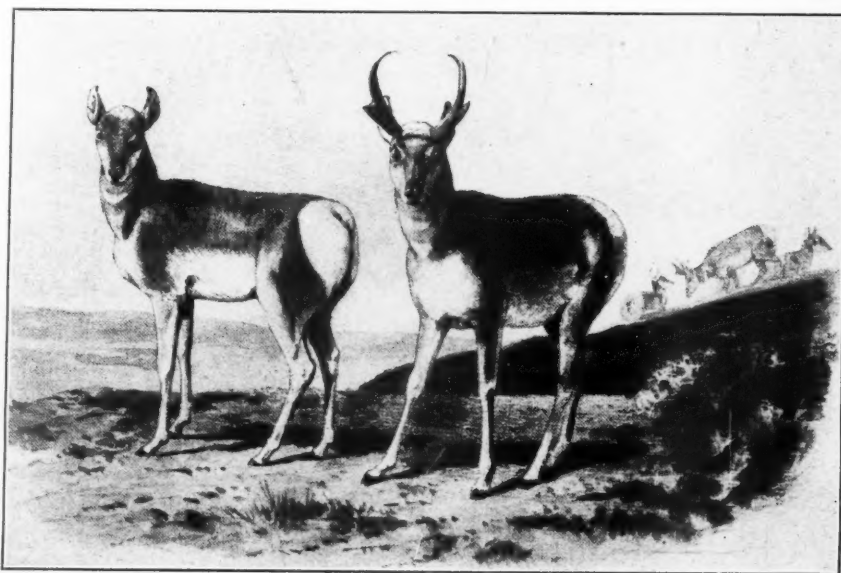
said to myself—and antelope they were, not over fifty yards off. Quietly I reached for my carbine and cocked it, but to shoot I would have to fire directly over Brown's body—use him as a rest, in fact. Two or three times I sighted, and finally I was sure I could plug the leading animal, an unusually fine buck. Glancing at my companion's face to make sure he would not bite his tongue off when the report came, I cracked away. Down went the buck! Off went the other two! Clean off the ground jumped Brown! On his feet in an instant was the sergeant—in fact, the camp was awake! A few words, however, soon explained things, and we all three walked over to where my game lay. He was not dead, while his immense eyes seemed to look defiantly at me. I took one of his horns in each hand with the view of moving him, so I could put him out of pain with my hunting-knife, when, to my surprise, he sprang to his feet, and with a twist of his powerful neck sent me flying head over heels. Then he stood and looked us over, but soon began to quiver at the knees, his body swayed, the white areas were raised on his rump, and in another moment he pitched over dead. I killed six more antelope that day, all

"single stalks;" the sergeant killed several more; but Brown said I had given him such a shock at daylight that he could not hit anything.

The cutaneous glands mentioned earlier in the present article are found in both buck and doe, and are, at all seasons, responsible for the indescribable and pungent odor which emanates from these animals. I am unable to state what the exact use of the glands and their secretions may be, but it would seem that the odor might be useful in one way: to protect the animals from the swarms of troublesome insects, such as gnats, mosquitoes, and flies. Its short tail is useless for such purposes, and these pests are truly frightful on the plains sometimes. I have yet to see an antelope annoyed by them, while I have seen horses driven nearly distracted. The secretion does not

affect or taint the animal, however, and antelope meat seems to be highly relished by everyone who has ever partaken of it.

In their feeding, prong-horns seem to confine themselves to the various grasses growing on the prairies, and never eat leaves or any kind of fruit. They are fond of "soda licks," so abundant in most of the regions they inhabit; but they will take common salt in lieu thereof. They make extremely engaging pets, and in reality this



A BUCK AND DOE

Figure 9. A very spirited and life-like picture showing the animals in the foreground alert and watchful while the others are feeding. Courtesy of the United States Cartridge Company.

is the only way we can fully study them. As the habits and morphology of the species have as yet by no means been exhausted, it is to be hoped that both science and private individuals will make constant endeavors to study them by such methods.

Every one who has ever hunted the antelope is aware of its fleetness for a short spurt, and how it then becomes fatigued and is even sometimes captured alive. While at Fort Laramie, I often saw these animals run down and taken with a pack of gaunt and vigorous greyhounds. In the chase they make some truly wonderful horizontal springs, but they fail utterly when they come to jump over anything a yard or more in height. During the rutting season the old bucks fight each other with all the lusty courage of yore, while the does never lack the necessary spirit to stoutly defend their young against

prairie, where the grass grew to a considerable height. They surrounded the animals and soon closed in upon them, which caused them to become so bewildered that they were at a loss to know what to do. All they could do in their fright and amazement was to huddle together, or wheel about in circles, or stand and stamp their feet, as the danger they were in became more and more apparent to them. "In the meanwhile, taking care to keep our bodies concealed in the long grass, we had continued to approach; and being now within sixty yards of the panic-stricken animals, I rose upon my feet, took deliberate aim, and fired into their midst. Sykesey and Tuolumne followed the example, and the Indians discharged their arrows. I reloaded as quickly as possible and fired a second shot, then, dropping the rifle, pulled my revolver in my right and my bowie-knife in my left hand,



THOSE LIVING OF THE PIONEER SURVEYORS OF THE "TERRITORIES" WILL RECALL THIS SCENE

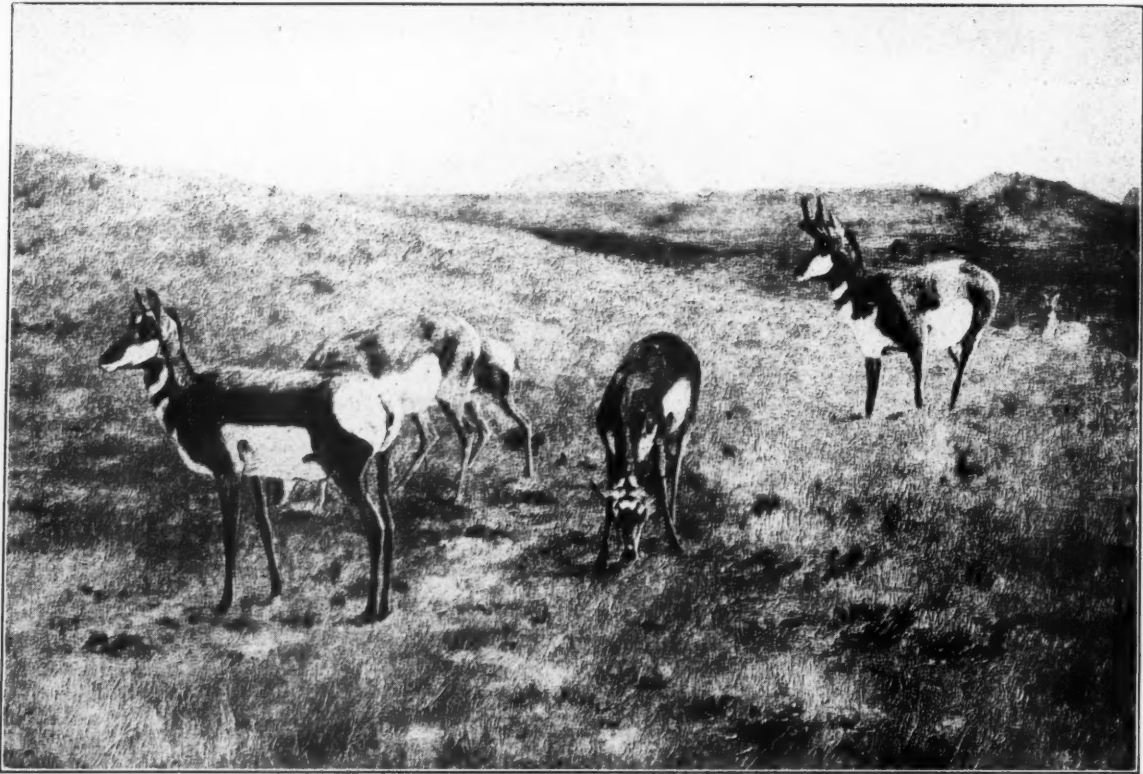
Figure 10. It is the right-hand third of a panoramic view of the "Glacial Lake and Moraines, on the New Fork of Green River—Wind River Mountains. Photograph by the author from Hayden's Twelfth Annual, United States Geological and Geographical Survey of the Territories. Specially selected to show the excellent running attitudes of the antelopes. From one of the most famous of the Government surveys, published in the early 80's.

any danger that threatens. Hunters also know how to take advantage of the almost insane curiosity these animals show when approached by any strange object on the feeding-grounds. The endeavor to inform himself on the salient points of a red flannel shirt waving in the air, has cost many an antelope his life, and I doubt very much whether any of them can tell a great deal about that garment today; I have induced them a number of times to approach me by simply lying on my back on the prairie and kicking my heels in the air.

Not a few of the early accounts of antelope hunting are very interesting, while others are, in some respects, quite remarkable. Here is one from an old work entitled, "Adventures of James C. Adams," which is quoted in *The Antelope and Deer of America*. It seems that Adams, together with a hunting-party of fifty men, struck a bunch of some fifty antelope out on the open

rushed into the thick of the herd, which continued wheeling and tramping around in a circle, seeing themselves surrounded on all sides, and too much alarmed to fly. At the same time my comrades rushed forward, and we were all soon mixed up together—myself, the Indians, and the antelopes. Having discharged the shots of my pistol, I began plying my knife, and as the Indians used theirs, we wounded several that escaped our fire-arms. In the midst of the excitement a buck broke away from the herd, and was immediately followed by all that were able to get away, some dragging lamed limbs after them. As, however, six dead and five wounded lay before us, there was no use pursuing the flying band, and they were allowed to escape, although we might easily have procured a dozen more."

Until late in the 70's the Indians on the plains depended to no little extent on the antelope for meat—



A "BUNCH OF ANTELOPE" ON THE OPEN PRAIRIE

Figure 11. Photographically copied by the author from a colored plate in "Mammals of America" courtesy of The University Society, Incorporated, of New York City. The original is an elegant canvas by the famous animal painter, Carl Rungius.

when deer, elk, or prairie-dogs were not available. In those times nearly all the Indians possessed fire-arms, and many of them were excellent shots; but formerly they hunted them with bows and arrows, as referred to by Caton in the following words: "Our antelope was an essential article of food among the aborigines inhabiting the country which it frequented before the introduction of fire-arms among them. They had various modes of capturing it, chief among which was the bow and arrow. This mode involved the necessity of getting a very close range. This could only be done by some kind of artifice, or by the most skilful and cautious stalking, always remembering its defective eyesight, its acute senses of hearing and smelling, as well as its inordinate curiosity. The latter infirmity was taken advantage of by the savage, who, approaching the game as nearly as he safely could from behind the sage bushes or other concealing object, exhibiting in irregular motion a piece of the tanned skin of the animal, colored red or white, or some other attractive object, would attract the game. When the attention of the antelope is attracted by such an object alternately appearing and disappearing, its curiosity becomes excited, and an interesting struggle

commences between that and its timidity; it will approach cautiously, then retreat a little, then prance around, drawing towards the object gradually, till it is finally brought within bow-shot. Then it was that the Indian would let fly his arrow from his concealment, or spring to his feet, the arrow to the string, and the bow partly drawn, and strike his victim before his fleetness could carry him beyond reach."

On a number of occasions our antelope has been kept in the paddocks or otherwise at the National Zoological Park with varying success. As a rule they do not breed under such conditions, and they frequently do not seem to either possess the desire or the power to have young.

Those who desire to carry the natural history of our antelope still further are referred to the interesting contributions to the subject by Dr. Murie, of England, and Dr. Canfield, who made his observations and experiments as long ago as April, 1828. Since his time many of our naturalists have devoted more or less literature to the life-history of this animal; while upon the other hand, various parts of its anatomy stand sadly in need of thorough examination and the results duly published.

ON ACCOUNT OF THE UNUSUAL DEMAND FOR THE EARLY ISSUES OF THIS YEAR'S MAGAZINE, YOUR ASSOCIATION WOULD APPRECIATE BACK COPIES OF 1920 NUMBERS FOR PURPOSES OF BINDING AND REFERENCE USE. PLEASE SEND THEM TO 1214 SIXTEENTH STREET, NORTHWEST, WASHINGTON, D. C.

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BOOK REVIEWS

A Guide to the Identification of Our More Useful Timbers. Herbert Stone, University Press, Cambridge.

A manual for the use of advanced forestry students, it gives information on certain points which are not easily accessible elsewhere. Two objects are kept in view—the observation of the characters of the different species and the utilization of those characters to discriminate between one species and another. The illustrations are restricted to figures which are deemed necessary where the critical detail can be seen only by means of the microscope or where such detail is a difference of degree and not of kind. The Generic numbers attached to the species correspond to the system by which the specimens of wood in the collection of the Harvard School of Forestry are arranged, thus making comparison ready and easy for the student.

Manual of the Timbers of the World. By Alexander L. Howard. The Macmillan Company, New York.

In his preface, the author says: "This book is not intended to supersede any of the works on timber hitherto published, but rather to supplement them. It has been put forward to meet a distinct want for a clearly-arranged handbook which shall contain information concerning all the timbers encountered in commerce, including those which have only of recent years appeared in the European market. The aim has been to treat the subject from its commercial, technical, and industrial aspects. In compiling this work I have adduced the practical experience of over forty years' work in the timber trade." The book itself is interestingly and practically arranged and beautifully made, and is a distinctly valuable addition to the forest literature.

A Tour of America's National Parks. By Henry Ottridge Reik, E. P. Dutton & Company, New York. Price, \$4.00.

While not a guide book in the ordinary sense, this book contains much valuable information about railroad routes and suggested hotels, and it is as well a charmingly written description of America's great national playgrounds. The parks are treated separately, and very interestingly. The object of the book, as explained by the author in the preface, is to "attract more widespread attention to the wonderful natural beauty of our country; to point out the possibilities of a 'Grand Tour' here at home that shall embrace more of scenic beauty and more marvelous natural phenomena than was ever included in a 'Grand Tour' of Europe, and to make clear to those who have but a limited vacation period what is to be seen in the different parks and how best to see it."

BOOKS ON FORESTRY

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THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.50
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
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THE KILN DRYING OF LUMBER—By Harry D. Tiemann.....	4.65
MODERN PULP AND PAPER MAKING—By G. S. Witham, Sr.....	6.15

* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

Conifers and Their Characteristics. By Charles Coleman-Rogers, The Macmillan Company, New York. Price, \$7.50.

The author is the Chairman of the Forestry Committee of the Royal Agricultural Society of England, and reading his book is like walking through a great forest with a learned and agreeable friend. The trip itself is delightful and the information

gained is well worth while. It is the work of an expert and contains a great amount of technical and scientific information, but it is nevertheless written in a manner that catches and holds the interest of the amateur nature observer. It is an invaluable aid for students and others in identifying the many different species of trees included in the category of the coniferae,

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and it also gives in anecdotal form much reliable information concerning the various trees, stories of their cultivation and growth, their habits and habitats, and other matters of general interest connected with their life history.

Snapshots of the Wild. By F. St. Mars. J. B. Lippincott Company, Philadelphia.

By the author of "Pinion and Paw," "On Nature's Trail," "The Prowlers," etc., this book of first class animal stories will interest the reader from start to finish. Their arrangement in groups under the names of the months is unique, and is a splendid idea, and a good educational feature as well.

Manual of Tropical and Sub-Tropical Fruits. By Wilson Popenoe. The Macmillan Company, New York. Price, \$5.00.

The unexploited fruit possibilities of the warm regions of the world are attracting a larger share of attention and capital every year. This book gives the results of the latest researches and practical experiences in cultivating the most promising fruits of these regions, excluding those already

thoroughly exploited. Among the hundred or more fruits discussed are the following: The avocado, which seems destined to rank with the olive because of its high oil content; the cherimoya and the sapodilla, neglected and delicious fruits for table use; the guava, the mango, the Chinese litchi, the breadfruit, the loquat, the papaya and the jujube.

Technique of Practical Drawing. By Edward S. Pilsworth. The Macmillan Company, New York.

This is a splendid book for teachers, students and professional artists, to whom technique is a subject of especial importance. The artist who works for reproduction needs the benefit of full knowledge of technique, while with the painter whose picture is itself the final result, the question of technique is of moment only, as it enables him better to visualize his inspiration and obtain the effect of light and shade or form that he desires. With the artist who is drawing for the average commercial purpose or use, the picture is only the beginning of a series of manipulations and the question of technique is all im-

portant, because it must conform to the limitations of the various processes through which it passes after it leaves the artist's hands. Thus to the great majority of artists who earn their living, not by painting pictures, but through some connection with the graphic arts, reproductive technique is an imperative necessity and this outline of its basic requirements will be of invaluable practical assistance.

Camp Lore and Wood Craft, by Dan Beard. J. B. Lippincott Company, Philadelphia. Price \$3.00.

This is another of the Woodcraft Series by the Big Scout who has done so much personally and individually to make familiar to American boys the ways of life in the out-of-doors. Profusely illustrated with sketches by the author, the many lessons on how to do things right when in the woods are clearly and interestingly given. The book will delight the heart of every lover of the out-of-doors—young or old—and will be eagerly seized upon by every American boy who wants to learn to do things as only that master of woodcraft—Dan Beard—can teach him to do them.



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A TRIP IN THE PISGAH NATIONAL FOREST

TELLING of an interesting trip taken with his two children, on horse back, in the Pisgah National Forest, in North Carolina, Clarence Lightner writes: "We were rather roughing it, and appreciated very much the maps, placed at such reasonable prices at the disposition of the public, issued by the Geological Survey. These were well and carefully made, but I am wondering whether up-to-date editions should not be made now? This with special reference to the Pisgah Quadrangle and the adjoining Saluda Quadrangle, where many changes in the roads have been made. In Pisgah Forest, I was impressed with the marvelous beauty and health giving properties of this reserva-

tion. Likely this is true also of Mt. Mitchell and other reservations.

"The usual approach to Pisgah Forest is from Candler, on the Murphy Railroad, from which a well-graded road climbs up the site of the new inn, which adjoins the lodge built there by Mr. George W. Vanderbilt during his lifetime. This inn first opened before entire completion in the latter part of July of this year, deserves special mention. Mr. Weston, who has the concession, and is managing the inn, has undoubtedly the right idea. The location of the inn, the equipment, and the treatment of guests, reminded me of El Tovar, at the Grand Canyon. Of course Mr. Weston is only beginning. The view from his location along the mountains, and across the Pink Beds, is certainly as de-

lightful, though not perhaps as astonishing, as the view from El Tovar. I hope that Mr. Weston will not be discouraged in the work. I am confident that his returns this season will seem pretty poor in view of his expenses. But his inn is such an exception in the Carolina Mountains that I fear it will not be adequately appreciated.

"We were on horses, and under the intelligent leadership of Mrs. W. E. Ludlum (the fourth member of our party), we got next to the forest as well as the people and animals therein. I was disappointed, before leaving Tryon (our starting point) to learn that Pisgah Forest was being lumbered, and feared that the government had bought what nobody wanted. However, our visit in and through the forest changed my views decidedly. While Mr. Vanderbilt did make a contract, with a total of twenty years to run, the benefits of which are now being exercised by the Carr Lumber Company at Pisgah Forest, near Brevard, North Carolina, I believe that the removal of the large timber, as provided in this contract, will not ruin the forest area. It is true that, for the time being, the activities of the Carr Lumber Company seriously mar the pleasures of a visit to the forest, especially when one enters from the Brevard side of the forest, and finds the old trails injured, if not obliterated, in many cases, so that even for horse back riding things are not as good as they might be.

"I wonder whether the lumber company might not be induced to be a little more gentle in what they do with the forests. Perhaps we have to submit to the use of soft coal on the curious little logging roads, but when they are through with the roads they should at least take up the ties as well as the old rails, and level things off a little bit, removing perhaps the evidence of the sluices, or whatever they call the conduits for getting the logs down the mountains, so that nature can reassert itself without too much delay and agony. It was a pleasure to find that the forest ranger and his assistants—I think some fifteen in all, of whom we perhaps met five—were so generously disposed to aid visitors, as well as to protect the forests."

WHEN the forest lookout on Tahquitz Peak, in the San Jacinto district, California, was incapacitated this fall Mrs. Reindorp, wife of the district ranger, donned khaki, loaded blankets and grub on a horse, and took over his duties, holding the lookout post for more than a week. This is one of the incidents reported to the United States Department of Agriculture through the Forest Service.

SHADE trees and ornamental shrubs in the United States represent a value of one billion dollars, according to the estimate of the United States Department of Agriculture. Ten million dollars damage is done annually by shade-tree insects.

NATIONAL FORESTS IN GREAT BRITAIN

"**L**ORD LOVAT gave me an interesting account of the purchasing and developing of the National Forests in Britain," writes Miss Emily Exley, who is well known as a landscape artist in Philadelphia, and who visited England last summer to learn at first hand of conditions and possibilities there. She continues: "At the outbreak of war National Forests did not exist in Britain. About 98 per cent of all woodlands were privately owned, with about 2 per cent owned by the King, known as Crown Lands. In 1919 the British Government made an appropriation of 3,500,000 pounds to be expended over a period of ten years—to buy and establish the National Forests, and in that same year about 500 acres had been bought and planted. The kinds of trees most generally used were the oak, ash, and beech in hardwoods and Norway spruce, Douglas fir, Japanese larch, *Thuja gigantica* and Scotch fir in the evergreens. Lord Lovat also told me of the establishment of the Forestry Commission in Britain and the work they are planning to do on educational lines and the re-establishment of forests in Britain. A systematic scheme of education is felt to be the primary duty of all forestry authorities throughout the Empire." Miss Exley also said that the Roads of Remembrance Association of Great Britain was very pleased with the sample tree marker used by the American Forestry Association in marking memorial trees.

URGES REFORESTATION

REFORESTATION of state forests to take the place of the natural growth that has been removed by the lumber industries and farm development, is strongly urged by General C. C. Andrews, a pioneer in forestry and the only one of Minnesota's 22 colonels in the Civil War now living.

He stresses the need of new forest growth and, in an interview to the Duluth *News Tribune*, said:

"While there is still much pine timber of natural growth in Minnesota and always will be, the greater part has been removed. Under the amendment to the constitution adopted in 1914 about 300,000 acres of the state's public land have been set apart as state forest. Of the state's remaining public land perhaps twice as much more will be so set apart. Most of the timber on the land, however, has been sold or soon will be, and removed.

"To have state forests on a proper scale our state must buy third and fourth rate land and plant it with pine as rapidly as the work can be done in a business like way. Only about five per cent of the area of cut-over pine land that is third or fourth rate, will be found well restocked with valuable kinds of trees, by natural growth. The bare part should be planted with three or four year old nursery grown pines. To grow tall pine trees free from limbs to a

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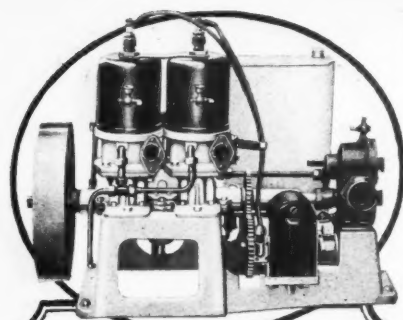
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height of from 40 to 60 feet they must be crowded when young and must therefore be planted about six feet apart, using 1,200 per acre. When about 80 years old they will have an average diameter of about 14 inches five feet from the ground. After that age the pine grows too slowly to earn good interest and is therefore cut in a normal forest.

"A normal forest is one from which enough timber can be removed every year for interest on the capital it represents, without impairing the capital. Nature will maintain it considerably by natural growth, but the areas not so restocked must be replanted. Before the great war, the German states planted annually, in the aggregate, 100,000 acres to maintain their state forests in normal condition."

TREES FROM SOUTH AMERICA

OWING to the unprecedented levels to which prices of railroad cross-ties have risen in this country, the Pennsylvania Railroad has decided to investigate the adaptability of the hard woods of Central and South America for this purpose. Inquiries have been started along several lines, not only to ascertain how much more cheaply ties, or the material for ties, can be purchased in those countries, but also to investigate the question of the longer life of ties made from the Southern hardwoods, as compared with those made from the North American native woods heretofore chiefly used. Under normal conditions, the Pennsylvania Railroad System uses from five million to six million cross-ties annually. White oak, the most desirable North American wood for this purpose, is becoming rapidly scarcer. The other available woods in this country have a very short life as ties, unless creosoted, which adds to their cost. The average net cost of railroad ties ready for placing in the roadbed has risen fully 100 per cent since the beginning of the war. Existing conditions now compel the railroad to seek out other markets for the purchase of its supply.

PLEASANT THINGS TAKEN FROM LETTERS TO THE EDITOR

"We take this opportunity to congratulate you upon your October issue of AMERICAN FORESTRY, which has just been received, and we wish you abundant success."

GLEN BROS. NURSERIES.

"I am with the Association with all my heart, and always was."

H. E. SCHMID.

"Our forests certainly need care and protection and I am pleased to know that there is an endeavor to watch over them. This is a noble work."

DR. F. C. HECKEL.

"We appreciate your magazine, which is filling a real need and is doing more to educate people to the proper utilization of our forests than any other instrument we now have, as far as I have any knowledge."

C. E. HAAK.

"I wish to add an expression of admiration of your magazine, which we have taken so long."

MISS LOUISA P. LORING.

"The arrival of publication dates of AMERICAN FORESTRY is looked forward to with keen interest by us here at the nursery, and we wish to congratulate you on the splendid work you are doing."

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"It would seem to me that your Association should have the hearty support of every progressive farmer with a wood lot."

J. FORD SEMPER.

"I feel guilty of an unfairness to myself for not sending in my check for membership before, for the architect cannot know too much about the source of the wood he constantly uses, and we all should be subscribing members at least."

G. W. BURKHEAD.

"You'll never be any more enthusiastic about saving the forests of America than I am right this minute, when I have just finished reading an issue of this wonderful magazine."

EDITOR, San Diego, California, Sun.

"I am glad to continue my subscription as I consider your efforts to keep forestry before the country fully as important as any issue that is now or likely to be in the future before the country."

GEORGE C. JOHNSON.

"I have just looked over and enjoyed the November issue of AMERICAN FORESTRY. I very much value the magazine and pass it on for others to read."

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THE GAS PUMP USEFUL IN FIGHTING FIRE

DURING the sessions of the Northeastern States Forest Fire Conference, held at Albany last February, several references were made by various speakers to the value of the gas pump in forest fire work. Mr. J. G. Peters, an official of the United States Forest Service, said: "Last summer we used for the first time one of the Fairbanks-Morse pumps. It was very satisfactory." Mr. Peters then proceeded to quote from a report he had on the large fires at Brown's Creek in Idaho: "For the next two weeks the gas pump ran splendidly and almost continuously day and night for the first two or three days. Undoubtedly the gas pump saved the day on Brown's Creek and prevented the loss of the plank road, the McGoldrick sawmill and logging camp and 10 or 15 million feet of timber. The road might possibly have been held with hand pumps, but it is doubtful. . . . Undoubtedly the gas pump can be used to advantage wherever a line is being held along a stream paralleled by a road, trail or fire line."

The use of such portable fire fighting equipment is quite general in Canada, two or three hundred of the Fairbanks-Morse outfits now being in use by lumber companies, railroads and the Dominion Government, and it is claimed that under severest tests they have given excellent service. The necessity for a lightweight portable pumping outfit, which can be easily carried to the nearest water supply in fighting forest fire is readily conceded. It makes sure the supply of water for the fire fighters, and can also be used to dampen down the fire so that the men can get closer up. Mr. Henry Sorgius, manager of the St. Maurice Forest Fire Protective Association, said that when they learned that experiments with mechanical pumping apparatus for fighting forest fires were under way, they immediately acquired such a pump and put it to practical use, supplementing the old fashioned equipment. He said that they found it necessary after the first season to have some minor changes made in the pump but that since then they have had no trouble whatever to start it or keep it going. They have now purchased several of these outfits and count them as one of their largest assets in fire fighting equipment. Mr. Sorgius said: "On two occasions last summer these pumps were a great help in saving two large storehouses when a bush fire was threatening to destroy them. We find it also very economical to run, as it will run for one hour on a gallon of gasoline." The pump can be used for backfiring and controlling slash burning operations as well as actual fire fighting.

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DOMESTIC EXPORT

PAPER FROM VENEER WASTE

IN the wood waste from veneer factories the United States Forest Products Laboratory sees considerable raw material suitable for the manufacture of high grades of paper. The cores of many kinds of veneer logs, now used in a large part for fuel, would make excellent pulpwood. In addition, a large part of the clippings and small veneer waste, which amount to one-fifth of the total veneer cut, probably could be turned into pulp stock with profit.

Among the veneer woods whose waste has papermaking possibilities are red gum, yellow poplar, cottonwood, birch, tupelo, basswood and beech. Many veneer factories cutting these species are already within shipping distance of pulp mills. In certain other cases, veneer factories are so grouped that they might furnish pulpwood enough to warrant the erection of a centrally-located mill. Other economic factors being favorable, such a mill could

profitably operate on a daily supply of veneer waste equivalent to 50 cords of ordinary pulpwood. Of course, the construction of a mill should be undertaken only upon the advice of a competent mill engineer after a careful survey of local conditions.

ZION NATIONAL PARK DEDICATED

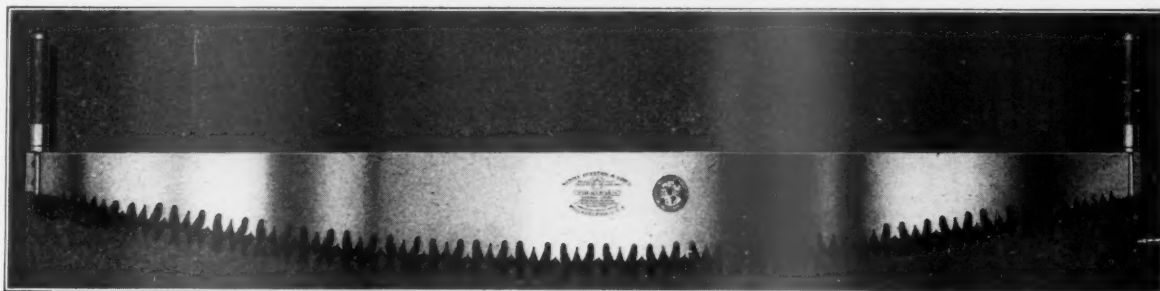
THE formal dedication of Zion National Park, Utah, to the American people was held on September 15, Stephen T. Mather, Director of the National Park Service presiding. Congress created the Zion Park, November 19, 1919, making it the nineteenth member of the National Park System. The area has been reserved since 1909, and was first known as the Mukuntuweap National Monument, and later as the Zion National Monument. Governor Simon Bamberger and United States Senators Reed, Smoot and William H. King solemnized the occasion with appropriate addresses.

Zion National Park is in extreme Southwestern Utah. It is reached by rail from both Salt Lake City and Los Angeles by the Salt Lake Route to Lund, thence by motor stage a distance of a hundred miles. It is also reached by motor from either Salt Lake City or Los Angeles over the Arrowhead Trail.

The park contains 120 square miles of 76,800 acres. Zion Canyon is the most important scenic feature, bisecting the park from north to south, it is 15 miles in length varying in width from 50 to 2,500 feet, with walls 800 to 2,000 feet high. A well known writer says: "This canyon, winding like a snake, abounding in enormous peaks and domes, and glowing like a Roman sash, is one of the most striking spectacles which even America has to offer." Because of its gorgeous coloring, Zion has been called the "Rainbow of the Desert."

Although the newest of our National Parks, Zion is only new in presentation as an attraction for the traveler and lover of the marvelous in nature. Geologically speaking, it is perhaps millions of years old, historically probably thousands. Only this year ruins of the Cliff dwellings of a pre-historic race have been discovered in almost inaccessible places in the canyon walls. The Mormon pioneers were the first of our time to discover the region, entering in 1858. In 1861, Brigham Young visited the region and named the canyon Little Zion. Captain C. E. Dutton, the celebrated geologist, wrote, "No wonder the fierce Mormon zealot who named it was reminded of the Great Zion on which his fervent thoughts were bent, of houses not built with hands, eternal in the heavens." Major Powell, noted explorer of the Grand Canyon, visited the region in 1870. Captain Dutton studied it several years later.

However, until the coming of the railroad and the motor road, few persons had ever seen the region. Elevated to parkhood, Zion has come into its own.



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STATE NEWS

ALASKA

THAT the turning to Alaska on the part of pulp and paper manufacturers seeking a new source of pulp wood will not only hasten the development of the territory but will greatly stimulate timber sale business on the two National Forests located in Alaska is the belief of United States Forest Service officials, as expressed in a recent bulletin sent out by the Service from its Alaskan station. The official records show that during the past 15 years more than 444 million feet of timber has been sold from the Alaskan National Forests. Including the fiscal year ended last June, a total of \$178,918.98 has been received by the territory from forest business on the two National Forests since the Forests were established. Twenty-five per cent of this money may be used for road and school purposes. An increase in these funds which would come from increased forest business, will be of great benefit in the development of the territory.

THE \$26,730.37 which has come to Alaska from the receipts from forest business on the Chugach and Tongass National Forests for the fiscal year ended June 30 makes a total amount of \$178,918.98 received by the territory from this source since the forests were established, according to figures just furnished by Forest officials.

This money, 25 per cent of the total receipts from National Forest business, goes into the road and school funds of the counties in which the forests are located; but in the case of Alaska, which has no counties, the funds may be used for road or school purposes by the territory in any part of Alaska.

That the turning to Alaska on the part of pulp and paper manufacturers seeking a new source of pulp wood will not only hasten the development of the territory, but will greatly stimulate timber sale business on the two National Forests located in Alaska is the belief of the Forest officials. The official records show that during the past fifteen years over 444 million feet, board measure, of timber has been sold from the Alaskan National Forests. Increased forest business will return to the territory more money for roads and schools, and these annual payments constitute one of the continuous benefits assured Alaska by the location of National Forests within her boundaries.

KENTUCKY

W. C. HANNA, State Commissioner of Agriculture, who has recently come in charge of the Forestry Department, has announced that several kinds of trees may be had free from the State nurseries for

the digging and removing. If any one wishes to have trees shipped to him, he may receive them by paying the actual shipping and wrapping costs. This is a good opportunity for Kentuckians to procure beautiful trees for their roadways and lawns.

The following species of trees are offered: White maple, sugar maple, birch, dogwood, redbud, elm, white oak, black oak, walnut, wild cherry, willow, catalpa, locust, cherry oak, pine, tulip poplar. Any one desiring information concerning the trees may write to W. C. Hanna, Commissioner of Agriculture, Frankfort.

MICHIGAN

MICHIGAN'S ninth forest preserve—the Lake Michigan State Forest, located in Emmet County—was formally opened October 1, according to Marcus Schaaf, state forester. This tract is located on Cecil Bay, seven miles from Carp Lake, and comprises 3,000 acres. Mr. Schaaf, whose headquarters are at Grayling, is now searching for a practical woodsman to take charge of the preserve. The state is resuming its pre-war policy this year, of opening two new preserves annually. The other preserve to be established this year is a 9,000-acre tract in Montmorency County. The state now has 600,000 acres in its preserves.

NEW YORK

THE New York State Forestry Association is planning a big forestry dinner, which is to be held at the Waldorf-Astoria in New York City on December 16. A large, enthusiastic gathering is expected and "A Guide to Action" is to be the general subject of discussion, for it is expected that the dinner will develop suggestions to be followed later in the formulation of the Association's legislative program to be brought before the coming session of the Legislature. The organization's slogan—"New York's Forests—A Heritage and A Hope" is inspiring, as indicating the enthusiastic spirit behind the enterprise.

FOREST FIRE LOSSES DURING 1920

NO loss of timber or equipment has occurred in the territory comprising several million acres protected by 66 wardens maintained by the Western Forestry and Conservation Association, and in general the forest fire loss in the Northwest has been less this year than last. Washington has had 754 fires in 1920 against 847 in 1919 and lost less than 42,000,000 feet of timber, compared to 60,000,000 feet last year. Of the 754 fires, 120 were due to campers, 74 to lighting, 60 to cigarettes. There have been an unusual number of lightning fires in Oregon this year but less loss than last year. The same is true of Montana and of other western states.

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FOREST SCHOOL NOTES

UNIVERSITY OF CALIFORNIA

A GENERAL study of fire damage to forest land in California has been conducted during the last six months under the auspices of a committee representing all of the forest interests of the state. Professor Donald Bruce, the University representative, reports that definite progress has been made towards a knowledge of the fundamentals of the fire problem in California as a result of trips taken by the members of the committee to investigate burned-over areas in the pine region.

The committee at its first meeting went unanimously on record in favor of keeping all fires out of forests during the dry season and announced that its objective is the formulation of a protective system that will both prevent material loss to mature timber and result in a minimum of damage to the productive capacity of forest soil at a minimum expense. Toward that end, it proposes to analyze and weigh all existing evidence on the following points:

Effect of fire on mature timber.

Effect of fire on young timber and on its rate of growth.

The value of advance reproduction.

The damage to timber by insects and the effect of fire thereon.

The cost of protective measures.

Another co-operative project of great interest is the one in connection with the proposed Redwood Park. A committee consisting of representatives from the Forest Service, the State Board of Forestry and the Forest School is to investigate and report on the lands in the coast redwood region most suitable for inclusion in a national Redwood Park. The Save the Redwoods League and the National Park Service have requested that this examination be made in the near future. Professor Woodbridge Metcalf is the Forest School representative on this committee.

COLORADO AGRICULTURAL COLLEGE, DEPARTMENT OF FORESTRY

THE new ranger course in the Colorado Agriculture College has been introduced this fall with seven students entering. The course is of high school grade under the administration of the preparatory department of the college.

The object is to fit men to be forest rangers or as woods foremen. The students may enter college and take the professional forestry course, or agriculture, upon completion of their three year pre-

paratory course and one extra year of preparation. But the majority of students in the preparatory department come from rural districts, take elementary courses chiefly in agriculture, and return to the farm at completion of the course.

Those taking the ranger course will be trained in agriculture as a major and in forestry as a minor, since at present the ranger usually graduates from forestry into ranching after some years of service on the National Forests. The preparation for forestry work offered in the School of Agriculture should yield fine results. The facilities for this instruction in the Colorado Agricultural College are excellent.

NEW YORK STATE COLLEGE OF FORESTRY AT SYRACUSE

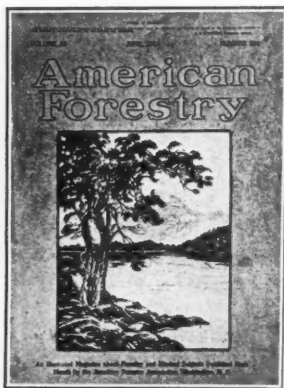
THE United States Forest Service has need for 2,500 forest rangers at once and the United States Board of Vocational Education has been asked to supply for this service as many partially disabled soldiers as are fitted for this rigorous out of door work, particularly those who, having been gassed, need out door air if they are to regain their strength.

The New York State College of Forestry at Syracuse has been asked by the voca-

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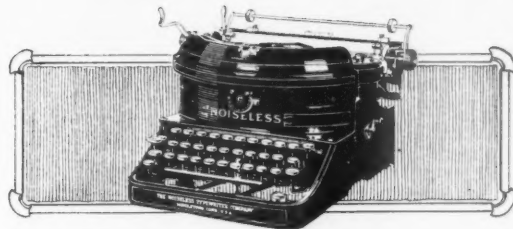
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tional education board to assist in training large numbers of these men, both in secondary and collegiate courses.

The trustees of the college have authorized courses for these men, both at the college at Syracuse, and at the state ranger school at Wanakena, a school giving secondary forestry education, but this assistance to the soldier is contingent upon the approval of the state legislature of a building program to house the men in the woods at Wanakena.

CONFERENCE ON FORESTRY EDUCATION

AN important conference on education in forestry will be held in New Haven on December 17 and 18 of the present year. The work of the conference will take the form of reports from a number of committees, each reporting on a certain phase of the subject. The entire subject will be covered by the various committees who are now working on their reports. All foresters and employers of foresters interested in this subject and who can arrange to do so, should attend the conference and participate in its activities.

FIGHTING THE BLISTER RUST

EXPERIMENTS in the warfare against the white pine blister rust, which are being carried on both in the east and in the central west, begin to point the way to better methods of attack. Such is the report of E. G. Cheyney, head of the for-

estry division of the Department of Agriculture, University of Minnesota.

The white pine blister rust, like the black stem rust of wheat, is kept alive and spread by a plant ally of the disease. The group of plants aiding the blister rust is known as ribes and is made up of the various species of currants and gooseberries. Sprayed from diseased pines cannot carry to other pines and infect them. The spores must first find lodgment on a currant or gooseberry bush and there develop into a spore. This may then be carried by the wind to infect them. If, therefore, the ribes tribe can be eradicated or greatly reduced, the danger to the pine areas will be removed, or at least greatly reduced.

Understanding this situation, Mr. Cheyney began at Rush Lake, Minnesota, a series of eradication investigations. In the course of these investigations in 1919, he uncovered the important fact that instead of pulling up the ribes plants, the best method seemed to be to grub them out. The reason was, that in the work of eradication it was found that neither from pulled nor from bed plants did there spring any root sprouts except where the root ends were exposed to the light. The inference from this was that the cutting off of the roots would seem to be more effective than pulling, for ordinary care would prevent leaving pieces of crown in grubbing, while only extraordinary care could prevent the leaving of exposed root ends after pulling. It is believed that the discovery of this fact will simplify, to some extent at least, the problem of eradication.

If, then, a high degree of efficiency in eradication can be maintained, the resprouting can be eliminated by improved methods, "the reduced leaf surface of the ribes crew of plants should certainly give a large measure of protection to white pine, if not complete exemption, from the disease."

OREGON AGRICULTURAL COLLEGE PROFESSOR W. J. CHAMBERLIN

of the Department of Entomology, Oregon Agricultural College, has for two months been studying extent of insect infestations in yellow pine and means for their control. His field of operations is southern Oregon.

Special areas have been examined and sample plots cruised in several instances, and breeding experiments for parasite which will prey on destructive beetles are under way. Professor Chamberlin has also collected some valuable data regarding natural enemies of the dendroctonus beetles.

Experiments looking to possibility of destroying beetles by use of electricity are being started and a demonstration on a scale sufficiently extensive to indicate the merits of this means of attack will shortly be undertaken. Up to the present time the only successful means for destroying the immature beetles has been peeling and burning the bark of infested trees. This is a slow and costly process.

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